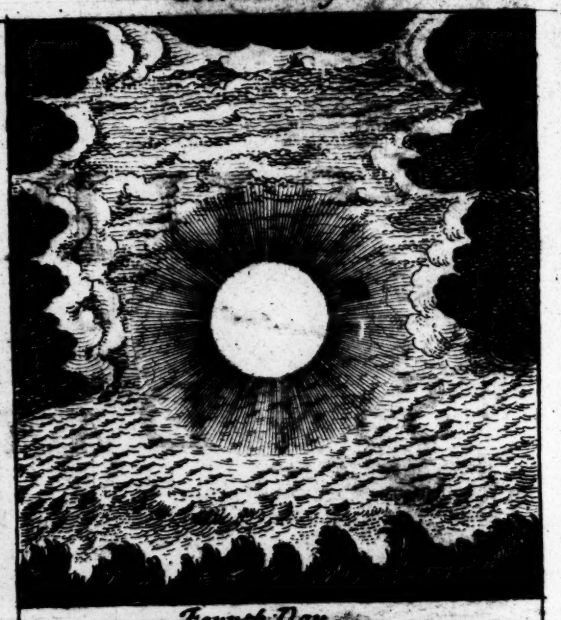
First Day

Second Day



Third Day

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Fifth Day

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I. Hulett delin.et sculp.t

First Day

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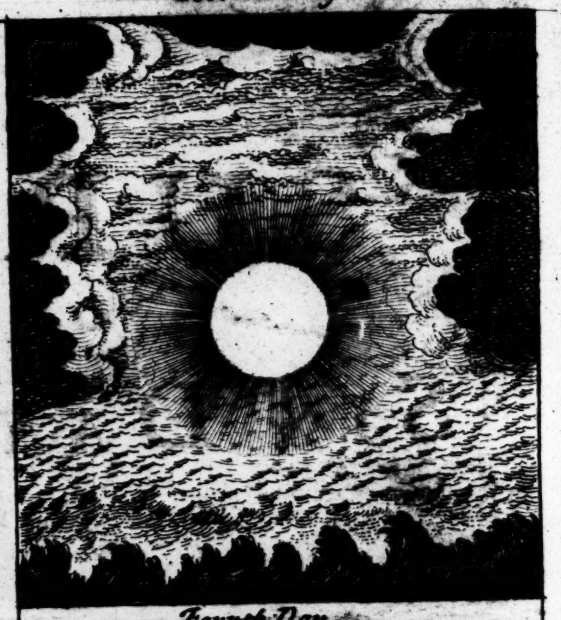

Third Day

Fourth Day

Fifth Day

Sixth Day

I. Hulett delin.et sculp.t

A

SURVEY

OF THE

SIX DAYS WORKS

OF THE

CREATION:

PHILOSOPHICALLY proving the Truth of the Account thereof, as delivered by MOSES in the First Chapter of *Geneſis*.

Wherein the magnificent Grandeur, inexpreſſible Beauty, Order and Harmony of this Syſtem in general, and of this habitable World in particular, are largely diſplay'd.

The Whole intermix'd with many novel and curious Obſervations, Metaphyſically conſidered and religiouſly apply'd.

By *BENJAMIN PARKER*,
AUTHOR of the
Philoſophical Meditations, &c.

LONDON,
Printed for the AUTHOR in *Falwood*'s Rents, *Holborn*; BENJAMIN STICHALL, Bookbinder, in *Blackmore-Street*, *Clare Market*; and Sold by R. BALDWIN and J. JEFFERIES, near Stationers Hall.

Where may be had a THIRD EDITION of the Author's PHILOSOPHICAL MEDITATIONS.

MDCCXLV.

SURVEY

SIX DAYS WORKS

CREATION:

The RIGHT HONOURABLE,

PHILIP, Earl of *Chesterfield*,

Baron STANHOPE of *Shelford*,

AND

Knight of the Most Noble Order of the Garter.

My LORD,

I Beg Leave to return my most grateful Acknowledgements for the Honour your Lordship did me by your first Subscription to the following Work, which I cannot doubt will remove those Disadvantages which otherwise my Obscurity might render it liable to: For the shining Rays of a sublime Genius, joined to a parallel Fortune falling upon an obscure and opake Body, where there is any Medium for their Entertainment, must certainly return a reflected Light: Thus your Lordship's Condescention in patronizing this well-design'd Performance, will render it more enter-

taining and useful to the present Generation: And as your Lordship's Character must necessarily appear illustrious in all succeeding Histories, so it will preserve that Regard for this Labour that shall continue its Usefulness to future Ages, and thereby make it better answer the Glory of God, and the Good of universal Mankind, which is the principal Intention of

I

My LORD,

Your Lordship's

Most obedient,

Most devoted,

Most obliged, and

Most humble Servant,

Benjamin Parker.

THE PREFACE.

NOthing can be more entertaining to the Mind of Man than the ſedate Contemplations of the Works of Creation, and Redemption; they being ſufficient to exerciſe his Wonder and Adoration for ever. What elſe can ſo raiſe and elevate our Admiration and chearful Praiſes of the Great Creator's infinite Power, unſearchable Wiſdom, and unfathomable Bounty? For in theſe Works are diſplayed the extenſive and incomprehenſible Wonders of immenſe Power and unlimited Goodneſs.

And amongst all the Animal Creation upon this Globe it was *Man* alone on whom God enstamped his own Image; and as it was in him also that he chose to finish his Six Days Works; so he appointed the next Day, and also enjoined the continual Observation of it, as a Sabbath Day, to be set apart for Man to converse, by Divine Contemplations, with the Fountain from whence he derived his Original, whereby he might enjoy a Concourse and Communion with his Maker, and the heavenly Society of Angels, from whence would flow to Man such satisfactory Draughts from the Fountain of Life as would sufficiently nourish his Soul and Intellectuals by the Streams flowing from that Fountain the other Six Days; so that by a constant Circulation there would arise to Man a never ceasing Delight and Pleasure in the complete Satisfaction that would hereby concenter in and acrue to both his Body and Soul: To his Body, in the full Provisions God had every Way made

made for him; and to his Soul, in making him capable ſeriouſly to contemplate upon theſe Bleſſings, being able to converſe with the Author of them, from whom he and all created Exiſtences had received their Originals, and all Bleſſings produced from his paſſive Works, created ſolely for the Uſes and Services of the intelligent and active Part of the Creation. I ſay, for Man to apply himſelf to theſe ſedate Meditations muſt neceſſarily work up his Mind to ſuch raviſhing Delights and inexpreſſible Gratitude as will vaſtly augment all the Enjoyments in themſelves thus provided for him.

And this ſuperior Delight and Pleaſure, *Man*, of all other Creatures was made particularly capable of; all other Creatures being only left to enjoy them in a ſatisfactory Way to their Wants, but not made of a Mind capacious enough to participate of the Pleaſures reſulting from the Contemplation of the Greatneſs, Power

and Goodneſs of that Being who is the Origin and Source thereof.

For the inferior Animals, over whom Man had Dominion given him, had no higher Ends and Aims than to be ſubject to their Maker's Repreſentative, whoſe ſuperior Intelligence to theirs they could never fathom, and therefore their Happineſs muſt depend upon his juſt Government; from which it was impoſſible for Man to deviate while he continued his original Purity, and therefore they muſt in that State enjoy the moſt perfect Happineſs under him that their different Capacities were capable of entertaining; for finding a Satisfaction in the plentiful Proviſions to ſupply all the Occaſions that their Natures and Conſtitutions required, their Happineſs was as conſiſtent with their State, and as much adapted to their ſmaller Capacities under the Enjoyment of ſo juſt and happy a Governor, as was conſiſtent with the Extent of their Intellectuals.

But

But Man who was made in the Image of his Maker, was capable of receiving the Enjoyment of those communicable Pleasures flowing from the first and supreme Original; whose Works, manifest his admirable Perfections to all his Creatures, endued with the Powers of phisical Reasonings upon them, from which must naturally flow such adorable Raptures of superlative Joys, elevated Delights, and unspeakable Gratitude for all the Advantages they find themselves possessed of upon a Globe, wherein nothing needful for all their Concerns of Life is wanting: And to complete their Enjoyments they also find a numerous Attendance of such agreable Subjects, who readily, joyfully and harmoniously congratulate their Coming and Coronation over them. For Man was thankfully received by them to be their Guide, Director and Governor, and to whom, he was the higheft, as God's Representative, that they were made capable of admiring and paying Obe-

dience to, and also to him they pay their Acknowledgments of Gratitude for all their plentiful Enjoyments in Life, as not being endued with such Faculties as are capable of being affected with any other than sensible Objects.

Therefore as Man of all the Animal Creation upon this Globe, only bore the Image of his Maker, and was thereby made his Representative to the Reſt, ſo he was only qualify'd in his Intellectuals for immediate Communications from the Original Fountain to raiſe his Pleaſures to Spiritual and higher Delights, which muſt vaſtly exceed all the Pleaſures ariſing from the moſt delightful Objects and Enjoyments of the outward Organs of the bodily Senſations.

For as to the Pleaſures ariſing from the outward Senſations, the reſt of the Animal Creation, are as capable of the enjoying them as *Man*, but beyond that, they can only look upon Man as their Governour, and to him return

return their Gratitude for thoſe Enjoyments.

Man then by receiving the grateful Returns from his Subjects for all their Enjoyments, under his juſt Government, and knowing from whence he received this Superiority over them, and from whom, not only his, but alſo their Bleſſings flow, muſt hereby be excited to preſent their Gratitudes along with his own to the ſupreme Fountain and Author of them: And in this would conſiſt his chiefeſt Happineſs by performing this with that Chearfulneſs and Alacrity that his Obligations and Duty muſt naturally require from him, thro' Love to, and Delight in ſo beneficent a Creator: And from this Duty returned to the Original Fountain, ſuch communicable Spiritual Pleaſures would naturally flow back to Man, upon thoſe Performances, that muſt be vaſtly ſuperior to ſuch as can ariſe from all his Reflections from natural Senſation, and

which the very Duty brings along with the Performance.

For tho' nothing can be added to this Fountain of Perfection to make it more complete than it is, yet all the Returns, that are made by created Beings, ſufficiently Rational to acknowledge their Off-ſpring, and Bleſſings provided for them, bring back to themſelves the greateſt Sweetneſs and Satisfaction.

And therefore it was appointed to Man after every Six Days of his Bodily Enjoyments flowing from the Objects of Senſe, that the next Day ſhould be ſet apart for theſe Spiritual Enjoyments of the communicable Pleaſures to be received from the infinite Perfections of his benificent Creator, that this might leave a pleaſant Reliſh and feeling Delight continually upon his Mind in all his ſubſequent Tranſactions.

Now we may obſerve that Man, in his firſt and pure Eſtate, was placed in the Poſſeſſion of a Fabrick ready

ready furniſhed with all ſurrounding Glories, and plentiful Proviſions, for his Pleaſure and Support; and theſe exactly adapted and proportioned to his own Qualifications to enjoy them; and his Qualifications as exactly ſuited to poſſeſs them; and alſo to govern that numerous Attendance of his inferior Fellow Creatures, which he finds ſubjected to him, they being of lower Degrees of Intelligence.

Now upon his Obſervations of the Forms, Powers, and Natures of each individual Species, as he found them adapted to ſuch particular Functions, either for the Services of Man immediately, or the mutual Harmony and Dependance of the Creation, ſo he aſſign'd each Names proportionate and proper thereto, from the moſt Noble to the moſt Ignoble, and ſcarce animated Part of the brutal Creation.

And now his next Curioſity and Delight muſt naturally ariſe from his Entertainment in the enamelled Fields, ſtocked with Flowers, Vegetables and

Fruit

Fruit-Trees; which were the passive and unintelligent Part of the Creation, as being only prepared for the Uses, Services, and Delights of the Intelligent Possessors of them; and therefore it was, that, by Creation, they were prepared and made before them: In which Man finds a Provision adequate to all the Wants of the whole intelligent Creation upon all the Earth, as being more than abundantly sufficient to give himself, and all living Animals both Satisfaction and Delights.

Then again, when Man turns his Eyes and considers the Luminaries that exhibit these Things to his View and Enjoyment, and observes, that by their passively Active Powers, as secondary Causes, they are not only the Means of making these things Visible, but are also the very Instruments of their natural Productions and Existencies, tho' themselves created unintelligent of their own Uses and Services, and yet made so passively Active,

only

only for the Service and Pleaſure of him and his Intelligently Active Subjects. Muſt not Man, then, with the greateſt Admiration and Gratitude acknowledge their Uſes, and even the neceſſity of their Exiſtence? Since it is thro' them that all Things are preſerved and enjoyed that render his own Being comfortable, and without which his being here would be intolerable, or impoſſible, in his preſent Circumſtances; but theſe Proviſions he finds exactly adapted to his Occaſions, and his Occaſions to them, ſo that by this harmonious Correſpondency, Man found the Happineſs of his primitive State complete.

Which Happineſs to partake of now, as near as we can, I think, is ſtill to meditate upon theſe unerring Works of infinite Wiſdom while we continue here in our relapſed State, and this is alſo the beſt Means to induce us to regulate our Actions in the Ways of Wiſdom, and thereby to prepare us for an Eternal Admiration, thro' our wonderful

wonderful Redemption, of the infinite Wiſdom and Goodneſs of God in ſuch Works, which we can here only have but very imperfect Ideas of.

But our frequent Contemplations of them are certainly the beſt Means to keep up our Deſires after a nearer Acquaintance with them; and the more we arrive thereto, by ſo much more will our Hearts be filled with pleaſing Wonder, and our Spirits raiſed to the feeling Praiſes of our Omnipotent Creator, in which we ſhall always find, even while here, the greateſt Pleaſure, and ſweeteſt Tranquility.

Upon ſuch Contemplations it muſt be that an ingenious Gentleman of my Acquaintance, in a Letter, breaks out into the following Expoſtulations, well worthy our Notice.

"If a contemplative Spectator on "this Terreſtrial Globe, ſhall open "his Eyes and take but a ſuperficial "View of the Furniture of the vaſt "Concave that ſurrounds him; and,

with

"with the ſublime Thoughts of a "Philoſopher, ſhall conſider the im-"menſe Diſtances of the illuſtrious "Bodies that garniſh it, and ſhall "look upon them, as ſo many Suns, "each with their peculiar Planets, "and, ſome of them, with Satellites; "and ſo views them as Worlds beyond "Worlds; Syſtems beyond Syſtems "regularly interſperſed, thro' the vaſt "and unfathomable Space: How muſt "his Imagination be ſtruck with the "Magnificence thereof, and be ſwal-"lowed up amidſt the Immenſity "of the Works of the Univerſe, "and his Mind raiſed with an ele-"vated Admiration of the Immenſity "and Power of that *Being*, who is "the *Author* of them?

"But ſhou'd this Spectator limit "his View, and confine his Contem-"plations to the Bodies of this our "Solar Syſtem; will not the Conſi-"derations of the Extent of their "mutual Gravitations, the ſuitable "Accommodation of the Ratio of the

"cen-

"centrepetal Forces to the Diſtances, "and periodic Times of the revolv- "ing Globes with their harmonious "Order and Regularity; I ſay, will "not theſe Obſervations fill his Mind "with thoſe Pleaſures that attend the "Ideas of Grandeur and the moſt ex- "quiſite Uniformity, and ſatisfy his "Underſtanding, with the moſt in- "conteſtible Inſtances of the Power, "Intelligence, Sagacity, and Wiſdom "of the great Author and Contriver "of them?

"But laſtly, ſhou'd this Spectator "confine his View only within the "Bounds of this habitable Globe; here "he may obſerve, that by the annual "Revolutions of the Earth, we have "the Viceſſitudes and Mutations of "Times and Seaſons; and that by "its diurnal Rotation we are accom- "modated with the ſucceſſive Re- "turns of Days and Nights; and that "by its Veſtment the Atmoſphere, "we have the Supplies neceſſary for "the Life, Vegetation and Preſer-

"vation

"vation of the Inhabitants thereof, "in the plentiful Provisions made for "the Subsistence of Animals: The "wise Formation of the Parts of each "of which are justly adapted to their "Purposes and Manner of Life, and "their Principles of Self Preservation "and Procreation: Now are not these "all standing Monuments, from Age "to Age of Design, Contrivance, "Wisdom, Power, and Goodness in "that Being, who is the Author of "this Fabric? The Contemplations "of the Magnificence and Beauty, "with the Variety of the Objects "thereof cannot but infuse the most "agreable and exquisite Pleasure, "and induce us to fear, venerate, "and love that immense Being, whose "tender Mercies are as extensive as "his Works." Thus far my learned Friend.

And as the Subjects of our Creation can never be sufficiently fathomed and admired by us, so they would have been enough in Man's pure Estate to

have

have exercised his Contemplations and Gratitude for ever by the seasonable Returns of his Seventh Day's Reflections; but since Man's Relapse from his original Purity, this Subject cou'd not have been contemplated on by him without the greatest Regret, because, by his Disobedience, he had forfeited all those glorious Advantages arising from God's bountiful Goodness in all the excellent Privileges to him arising, in his State of Purity, from his Admirable Works; I say, Man cou'd not then, in his fallen State, have thought of these Things without the greatest Regret, had not God's more remarkable and bountiful Goodness in his glorious Promise to redeem Mankind appear'd, as it did speedily, to offer him still more glorious Advantages than were lost by his Transgression, which has ever since put us under a two-fold Obligation, the very Performance of which carry their Pleasures along with them, viz. The Meditations of the admi-

rable

rable Works of the Creation, and the glorious Bleſſings flowing from our wonderful Redemption: Which was to be reflected on by our firſt Parents, and all their Off-ſpring from the Time of the Promiſe of that Redemption upon each ſeventh Day, as well as the admirable Works of the Creation; they having an equal Right thereto from the Promiſe of it, which we now enjoy ſince the Completion thereof by the Incarnation, perfect Obedience, Death, and Reſurrection of our bleſſed Saviour JESUS CHRIST: For ſuch of Man's Poſterity, as were born before his Appearance in the Fleſh, and Sufferings for them, might meditate both upon the Subjects of the Creation and promiſed Redemption every ſeventh Day; ſince by the Promiſes of this Redemption they were entitled to the Advantages of it; for the Promiſes of God are infallible: But after his compleating our Redemption by his glorious Reſurrection on the firſt Day of the Week, they, who have ſince then made their firſt Entrance into the

World, to whom theſe glorious Advantages have been revealed, and who have joyfully embraced them, have with very good Reaſon choſe to make uſe of the firſt Day of the Week, upon which our bleſſed Saviour completed our Redemption by his glorious Reſurrection, for the Exerciſe of theſe ſpiritual and delightful Duties. And as there can never want Subjects of them for the Entertainment of our ſerious Reflections; and as it is the Buſineſs of our whole Lives to aſpire after the Knowledge of God's Power, Wiſdom, and Goodneſs manifeſted in theſe Works, ſo the following Treatiſe, as well as moſt of my former, is the Product of my Contemplations thereupon; and from my Hopes, that they may aid, and aſſiſt others in their retired Meditations, I commit them therefore to the World with that Deſign, wiſhing they may anſwer that End, and promote in all, into whoſe Hands they ſhall fall, a Preparedneſs for the future eternal Admirations of the unfathomable

ble Works of infinite Wiſdom and Goodneſs in that eternal Sabbath of Reſt, where no ſecular Concerns can ever break in upon us to diſcompoſe our Thoughts, or invade or leſſen our Delights and Pleaſures, when tranſported therewith to encreaſing Elevations.

B. P.

ERRATA.

PAge 11, Line 30, *dele* ſince; p. 24, l. 7, for diſtriboted, read diſtributed, p. 72, l. 29, f. §. 8, ſay §. 9. p. 100, l. 25, f. retrogade, r. retrograde; p. 133, l. 28, after §. add 1. p. 203, l. 8. f. § 6. ſay § 7, p. 213. l. 9. f. and r. as. p. 231, l. 27. *dele* Life, and Perception, and. p. 249. l. 15, *after* were *add* alike. p. 282. l. 16. f. acquiece r. acquieſce. p. 294. l. 1. f. D. r. Deep.

N. B. If any other literal Miſtakes may have eſcaped Notice, the Reader is deſired to correct them.

To the *Ingenuous* AUTHOR of the ſucceeding Work.

FOR thoſe fair Truths You have ſo well diſplay'd,
To all your Labours juſt Regard be paid
By all, who have Reſpect for Wiſdom's Way,
And due Obedience to her Dictates pay.
You well have ſhewn us, ſince the World begun,
What Harmony throughout the Fabrick run:
What nice Connection does the whole attend,
And every Being ſuited to its End.

Of Late we ſee, on gloſſy Marble Stones,
Where reſts beneath a quondam Poet's Bones;
A vaſt Expence to poliſh, gild, and carve;
But when alive did kindly let him ſtarve.

What can avail ſuch Pageantry and Show,
To Him whoſe Life was but a Life of Woe?
But ſure where're an Author's worth Reward,
He Living beſt muſt merit their Regard;
And they more Praiſe, the more they ſhall diſpence,
To Worth in Want, their kind Benevolence.

And Some there are, who've long in Britain *ſtood,*
Diſtinguiſhed by being Great and Good,
Who merit with our Anceſtors of Yore,
A Name that laſts till Time ſhall be no more.

Your Friend,

2 December, 1744.

Jonathan R. Scott.

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A SURVEY OF THE SIX DAYS WORKS OF THE CREATION, &c.

The INTRODUCTION.

WHEN I consider the unfathomable Arcana of the immense Works of the Author of Nature, the surprising Harmony and wonderful Beauty of the created Bodies of the Universe, nay, even of the inconceivable Order of the Solar System, and particularly of this Globe, of which we are Inhabitants, I cannot sufficiently admire the Author of them. With what astonishing Power and incomprehensible

Wiſdom muſt theſe wonderful Works be adjuſted!

My Want of Language to expreſs the Admiration I am ſtruck with, when I enter into Contemplations hereupon, almoſt ſinks me beneath the Attempt, which I had earneſtly engaged myſelf in, and coveted to purſue. Since I find the Taſk, tho' inviting, above the beſt Language I am Maſter of; ſince I want Words to expreſs my elevated Thoughts, inward Conceptions, and aſtoniſhing Admiration, when I enter into a ſerious Recollection, in my moſt retired Meditations, of the Wiſdom and Power of the CREATOR of theſe wonderful Works, I am even dazzled, not only with the Beauty and harmonious Order of each Individual of the Works of that unlimited Power and Wiſdom that firſt brought them into Exiſtence, but the Order and Form in which they now appear.

To help us, however, to a Glimpſe of the Power and Wiſdom of our Great Creator, and of his no leſs bountiful Goodneſs and tender Mercies throughout the Works of his Hands, let us take a Survey of, and examine into the Beauty and Truth of the Account of the Creation, as recorded by *Moſes* in the Firſt Chapter of *Geneſis*.

CHAP.

CHAP. I.

GENESIS I. 1.

IN the Beginning God created the Heaven and the Earth.

§. 1. In these Words we may observe the Non-Existence of Heaven and Earth till the Beginning, and their Production from Non-Existence *in the Beginning*, wherein God is said to *create* them; that is, to produce their Substance from their Non-Entity, Non-Materiality, or Non-Existence. Here the Power of God is set forth, by bringing that into Being, which was not in Being, or had no Existence before.

But as this is a Power above the Reach of our finite Capacities to comprehend, Many, who would chuse to believe Nothing that is beyond the Sphere of their Comprehensions, have chose to affirm, That it was impossible for God, himself, to create Something out of Nothing; and that the Materials, at least, of which the Heaven and Earth were composed, were in some Manner

Self-existent, and therefore ready to be form'd into Globes, as his Wisdom shou'd direct.

But was this possible (as I shall prove immediately it could not) why is God here said to *create* them in the Beginning of his first setting out to work? To create them was not to form them into that Order in which they now appear; No, he had this Work of Formation to perform after the Production or Creation of the Materials, as will appear from the very next Words; *And the Earth was without Form*; and therefore without Form after its Creation; so that it must necessarily be created only at first in a chaotical Substance; and after that Substance or Matter of which it consisted, was created, it remained in a confused State, as Materials brought together for the raising a sumptuous Fabrick, till that Almighty Power, that was the Author of its Production, should think fit to establish Laws for forming that confused Chaos into Order, which upon its first Production or Creation it is said to be without. 'Tis likewise said to be created in the Beginning, that is, in the Beginning of *Time*; for Time only commenced with whatever God first created, and therefore as God is here said, *to create Heaven and Earth in the Beginning*, our Globe may bear Date with the most ancient Workmanship of the Almighty, which, as observed above, from the Account of *Moses*, was created or made from its Non-Existence, for supposing it to have had a necessary Existence, without Cause or Original,

t muſt then, in a Philoſophical Senſe, as neceſſarily have exiſted every where, as any where; nd whatever neceſſarily exiſts, can ſuffer neither Change nor Form, any more than it can want Production: But it appears from the Words of *Moſes*, that the Heaven and the Earth were created before they were put into Form: And I ſhall endeavour to make it appear, that his Account of *Moſes* is genuine and true, from he very Nature of it philoſophically conſider'd.

§. 2. That Being, which neceſſarily, and without Cauſe or Creation, exiſts, as above obſerv'd, muſt equally exiſt every where, and herefore infinitely; and whatever infinitely xiſts cannot want any Perfections; ſince nohing can be wanting in *Infinity*, that it is not poſſeſſed of, and therefore it muſt be poſſeſſed of infinite Perfections; ſo that infinite Intelligence, Wiſdom, Power, *&c.* muſt neceſſarily accompany a Self-Exiſtent and Infinite Being; ſo that neither Power nor Wiſdom could be wanting in an infinite Exiſtence to *create*, as well as *form* whatever was agreeable to that infinite Wiſdom and Power; which Power, being Infinite, was able to bring into Exiſtence that which did not before exiſt; as well as to form the Matter afterwards from its chaotical Subſtance, and likewiſe ſo to modify certain Portions thereof to become the Habitations of living and Spiritual Exiſtences.

For what can be too hard for infinite Power

to effect? And infinite Power, as above obſerv'd, muſt neceſſarily be lodged in a Self-Exiſtent Being, as muſt appear to our Conceptions, if we rightly frame our Ideas of ſuch an Exiſtence. For neceſſary Exiſtence will firſt inform our Minds of infinite Exiſtence; its Infinity will as neceſſarily communicate to our Ideas its abſolute Perfections, and in abſolute Perfections there muſt neceſſarily be infinite Intelligence, Power, Wiſdom, *&c.* as the inſeparable Reſult of infinite Perfections; and this Self-exiſtent Eſſence being neceſſarily every where, in him muſt exiſt whatever he has created, or can create; ſince no other *UBI* can poſſibly be found to exiſt in.

Created Intelligence, tho' active, is not Self-exiſtent: Can Matter then be Self-exiſtent, which is entirely Paſſive, when, as before obſerved, independent neceſſary Exiſtence implies Intelligence, Wiſdom, Power, *&c.*? But, as Matter is of its own Nature merely inactive, imperceptible, and ſubjected to the Will and Power of the Agent that acts upon it, it could not therefore be Self-exiſtent, but was created by an Infinite, Immaterial and Powerful Agent.

§. 3. Now whether this Beginning, in which God created the Heaven and the Earth, was the Beginning of the whole Material Creation, or had only reſpect to this Heaven and Earth to which we belong, cannot, I think, be indiſputably determined: But whether it was or not, the Creation of this Globe which we inhabit was

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the Beginning with Reſpect to us, tho' there might be numberleſs Globes created before it; for the Creation of each muſt be the Beginning of Time with Reſpect to them, as the Creation of this Globe was the Beginning of Time with Reſpect to us.

Tho' the beginning of Time, with Regard to every one's particular Exiſtence, commences with his very Acceſſion into Exiſtence, yet all ſuch as come into the World by lineal Generation (when they come to Knowledge) may look back, by the Hiſtorical or Traditional Accounts of their Forefathers, into thoſe Times of which they never were poſſeſſed; ſo that, tho' the Beginning of Time, with Reſpect to each one's own Exiſtence is the Beginning of his Exiſtence, yet the Beginning of Time with Regard to the Accounts we have of the firſt Productions of created Exiſtencies, can only be look'd into by Hiſtorical Informations; and from thence at a Diſtance we can ſee indeed into the Times paſt before we exiſted, but not ſo clearly as we can ſee into thoſe Times whereof we have a Remembrance ſince our own Entrance into the World.

Now, our own Globe, being that to which we are at preſent confin'd and related, it cou'd be of no immediate Concern to our preſent State to have the Myſteries of the Creation of other Globes made known to us here, tho' our Curioſity of Speculation into this Myſtery may be excited, and our Reaſon and Philoſophy exerciſed concerning them, ſo far as it tends to

the ſetting forth the Glory of our Infinite CREATOR, and encreaſing our Adorations and Praiſes of him.

And as we are here informed, that this Globe was created in the Beginning (tho' I ſhall ſtill leave it to every ingenuous Enquirer's particular Judgment) I ſhall give ſome Reaſons, why I rather chuſe to ſuppoſe, not only from the Words themſelves, *In the Beginning*, that this very Globe, to which we belong, was created in the very Beginning of Creation, but alſo from that very Reaſon and Wiſdom which is ſo conſpicuous from the preſent Situation of the whole.

The Words of *Moſes*, *In the Beginning God created the Heaven and the Earth*, ſeem to imply; In the Beginning, when God firſt began his Works, he created the Heaven and the Earth, and tho' I allow the Words may bear a more limited Senſe, yet without a Reaſon for their Limitation, the plain Senſe thereof, I think, ſhould be adhered to, and eſpecially when from this plain and obvious Senſe much greater Wiſdom and Contrivance in the Order and Diſpoſition will philoſophically appear.

And that it is moſt agreeable to Philoſophy we ſhould ſo underſtand them, I preſume, may be obſerved from the following Reaſons.

Firſt, From this Globe's Situation, which in the Solar Syſtem is in, or near, the Middle of the Reſt of the Planets, that have their Lights and Heats communicated from the Sun to their Surfaces.

Secondly,

Secondly, From the middle Situation of this our Syſtem with regard to the Reſt of the Syſtems of the Fixed Stars, which we now, I think, with very good Reaſon conſider as ſo many Luminaries diſperſing their Light and Heat to diſtant Globes, tho' undiſcernable to us (of which I ſhall ſpeak more fully when I come to the Fourth Day's Work of the Creation.)

Thirdly, From the neceſſary Dependence of our Attendant, the *Moon*, which is ſo ſituated as to accompany our Earth, by her Menſtrual Motion, thro' all her annual Revolutions; theſe Situations, I ſay, of our own Globe, and our own Attendant the Moon, ſeem to make it moſt conſonant to Reaſon, that they received their Creation, Production, or Beginning of Exiſtence and afterwards their Formations together; and this ſtill ſeems more probable, becauſe,

Fourthly, By all Accounts from Hiſtory, no new Productions of any other Luminaries in Times paſt have ever been diſcover'd; for as to new Stars amongſt the Fixed Stars, none of them have ever taken fixed Seats in their Manſions, but always continued to move their firſt Quarters, and again diſappeared; which muſt neceſſarily ſhew them to be wandering Stars or Comets, making their Revolutions among the *Fixed Stars*; and ſometimes coming ſo near to us, as to be diſcernable, and again removing ſo far from us, as to become inviſible to us; ſo that,

Fifthly, The Globes of the Univerſe, that we are acquainted with, from any Thing that we find

find upon Record to the contrary, are of as old a Date as our own, the Moon not excepted; and then, why may not ours be as old as them? If the Moon herſelf is not of a ſhorter Date than the Earth, Reaſon and the known Laws of Nature will not admit it to be older, ſince therefore it is not ſubſequent to it, in Time, it muſt be coeval with it. Wherefore,

Firſt, If our Earth has its Situation near the middle of the Planets of this Solar Syſtem, and

Secondly, If it be likewiſe, as it were, in the Middle of the whole Syſtems of the Fixed Stars, it is moſt probable, as will hereafter more fully appear, that they were all created at the ſame Beginning of Time. And,

Thirdly, If the Moon, our Earth's Attendant, continues her annual Revolution with, as well as her Menſtrual Motion round this Earth; and looks upon this Earth as her Center, then certainly this Earth muſt be as ancient, as the circumferent Globe which reſpects it. And,

Fourthly, If we can diſcover no new Productions amongſt the Luminaries of the Fixed Stars, And,

Fifthly, If all the Luminaries and Globes we are acquainted with, are, for ought we know to the contrary, of as old a Date as this Earth, then how can it be unreaſonable to ſuppoſe, that this Earth ſhould bear the ſame Date of Creation with the Reſt of the Globes of the Univerſe, and they the ſame with it? Or is it not moſt probable, that they were all created, or produced

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out of their Non-Exiſtence at the ſame Beginning; as has likewiſe been proved to be the plain Senſe of the Text?

For a further Illuſtration of this Hypotheſis, let it be conſidered, that had the other Material Bodies of the Univerſe been created, and taken their Situations before the Earth, the Earth would then, in Conſequence of Nature's eſtabliſhed Laws, have been placed in the Periphery of the Material Creation, and have had her Limits confined to the Boundaries of the whole; and her Inhabitants would have beheld none of the Fixed Stars in the Night but when the Sun was ſeated by the Earth's Revolution to the outermoſt Periphery thereof.

So that from theſe Conſiderations, I think it moſt reaſonable to ſuppoſe, that this Beginning of Creation reſpects, not only the Creation of this Globe in Particular, but of the whole Material Creation in General: And if ſo, then the whole Material Creation, at leaſt as much of it as we are acquainted with, was created in this Beginning: And tho' it may be, yea has been, imagin'd, that many of the Luminaries and revolving Orbs belonging to them might at diſtant Times receive their Formations from their Chaotical Subſtances, yet 'tis very probable, in my Opinion, that they did not. For beſides the Reaſons before-mention'd for their material Subſtances being created together, ſince we find none of the other Syſtems, diſcoverable by us, formed ſince ours was, in our View; why ſhould

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we imagine this Syſtem formed ſince theirs were in their View? I ſee no Reaſon to imagine one more than the other.

And, as the Reaſons above alledged make it moſt probable, that the whole Material Creation receiv'd its Production at the ſame Beginning of Time, ſo it is likewiſe moſt reaſonable to ſuppoſe, that all the Material Bodies of the Univerſe, of which we have any Idea, received their Order and Form at one and the ſame Time, and after the ſame Manner, with Allowance for their different Uſes and Elementary Qualities and Quantities; and were at once, not only made ſerviceable to their Inhabitants; but were alſo, at firſt, ſo placed, as to become uſeful and ſerviceable in innumerable Inſtances to one another: But had they not thus taken their Formations together, then the Services which they afford one another would have been wanted till the Creation and Formation of thoſe other Globes, which would naturally afford ſuch Services; and therefore it muſt argue the greater Wiſdom and Goodneſs, firſt to create, and afterwards to form them all, at one and the ſame Time.

For, as Time only commenced with the Beginning of the Creation, and there could be no Time before, it muſt therefore be as eaſy to the Imagination, to think, that God had produced no Material Creations before that in which this Earth had its Share, and that the whole Material Creation was performed at one and the ſame Time,

Time, as to imagine, that God had created Globes, and Inhabitants upon them, Ten Thouſand Millions of this World's Ages before he created this Globe and us: For whether they were created together or ſeparately, in regard to God's Eternity, is equally the ſame; for if you would run never ſo far backward for the Beginning of Creation, you can never come the nearer to God's Eternity, *à parte ante* (as we are forced to expreſs it) nor would God's paſt Eternity before his Creations have yet been lengthened, had he begun to create but from this very Moment.

Thus 'tis to all created Intelligent Beings, upon their Entrance into Exiſtence, as if there had been no Time before; for with Reſpect to their Exiſtence it is one and the ſame to them as if there had not.

There is an Advantage however ariſing to thoſe, whoſe Exiſtence commences in the latter Ages of the World, ſince they may carry their Conceptions of Things, from genuine hiſtorical Relations, to the very Beginning of the Creation.

COROLLARY.

If we then can thus carry our imperfect Conceptions of Things to the very Beginning of Time, by genuine hiſtorical Relations, we may ſo far, as it were, bring Time paſt to our own Account, and ſo have the Advantage of looking back beyond the Beginning of our own Exiſtence,

ence, and in this Senſe, even to the Beginning of Time; which Advantage may, in one Manner, even on a preſent Account, compenſate for the Shortneſs of our Lives in theſe latter Ages; but they who enjoyed the greateſt Longevity in the Beginning of the World, had no Times to look into paſt their own, having no Accounts of Times earlier than their own, or at moſt, of not above one Generation paſt, beyond their own Knowledge and Remembrance: Their Times are likewiſe paſt with Reſpect to this Life, and ours are preſent, we have therefore, in this Caſe, the preſent Advantage, and preſent Time is always the moſt precious, if truly improved: We can look back into their Annals, and, as in a Glaſs, behold their paſt Tranſactions; but it was impoſſible, without the Spirit of Prophecy, which was very rare, and never ſo plain as hiſtorical Relations, for them to be ſo converſant with Times to come, as it is for us to converſe with Times paſt, even to the Beginning of it.

Before we exiſted that Part of Duration correſponding to the State of our Non-Exiſtence, was no Time to us; ſince we have been brought into Exiſtence, the longer the Creation has been before our Time of beginning to exiſt, the View backwards from the Hiſtories of former Ages into paſt Tranſactions, gives us a greater Opportunity of lengthening our own Time, ſince thereby we may ſee into all paſt Occurrences, that genuine Hiſtories can furniſh us with, that

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former Ages have been engaged and concerned in; of which we may make a very great Advantage, if not wilfully wanting to ourſelves, by ſhunning ſuch Vices, as have introduced Ruin upon thoſe who practiſed them, and by imitating ſuch Virtues, as have carried their Rewards along with them: But foraſmuch as they who lived in the firſt Ages had not theſe Advantages, we have no Reaſon to grudge them their Longevity, ſince their Length of Days upon Earth was the only Means they could enjoy to ſupply this Defect: Let us not then envy their Length of Days in Times paſt, ſince we, by enjoying a preſent, tho' ſhort Time, have the Opportunity to lengthen it backward, even to the Beginning of Time, in which God created the Heaven and the Earth.

CHAP. II.

I Have obſerved, that the Creation of Heaven and Earth muſt neceſſarily imply a Production of them from their prior State of Non-Exiſtence, for to *create* plainly imports the making of Something, which had no Being before, or which before had no manner of neceſſary Exiſtence in its own Nature; which Production was, at firſt, only of its Subſtance, Elements, or Materials, proper to form their future Structure, which, before their Formation, lay mixed, out of all Order and Form, in Chaotical Confuſion,

and

and without any Separation of Earth, Air, Fire and Water.

And now the Materials were created and made ready, whenever it ſhould pleaſe the Almighty to eſtabliſh and appoint them Laws of Separation and a proper Diviſion of the Elements that were neceſſary to the Formation of this Heaven and Earth.

And here, by the Term *Heaven*, is ſignify'd that Air or Atmoſphere which was then ſo totally intermix'd with the Reſt of the Elements, as render'd it incapable of thoſe Offices for which it was deſign'd, and to which by its ſufficient Separation it is now adapted: As may be obſerv'd from

VERSE II.

And the Earth was without Form, and Void, and Darkneſs was upon the Face of the Deep; and the Spirit of God moved upon the Face of the Waters.

§. 1. Now, from the Earth's being without Form, we may obſerve, as above, its chaotical State, in which it was altogether unfit for the Purpoſes for which it was afterwards deſign'd, and fitted for by its Formation, which after this Production it was to receive: But, how long it remain'd in this Chaotical State before its Formation, I ſhall not undertake to determine, but till then a *Void and Darkneſs were upon the Face of the Deep.*

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There was then no circumambient Atmoſphere eparated from the groſſer Parts of Matter, but he groſſer and finer Parts had an equal Diſtribu-ion thro' the whole; ſo that from the exterior arts of the Subſtance, thus chaotically mixed, here was nothing but a Void, or perfect Vacuum urrounding it, no Medium for the Entertain-nent of Light, and therefore till there was ſome eparation of the purer from the groſſer, opake, eterogeneous Parts, Darkneſs muſt neceſſarily, y the Order of Nature, remain upon the Face f the Deep, or Superficies of that Chaos, till he Spirit of God moved upon the Face of the Vaters, or the Superficies of the Chaotical Fluid. n this indigeſted State of Heaven and Earth, the rimary compoſed Particles of Solids and Fluids, ere together in a fluid State, till they had their roper Laws aſſign'd them, to aſſume their pe-uliar Eſſences and Places; and in this State, they re therefore moſt properly altogether called Wa-ers; upon which the Spirit of God is here ſaid rſt to *move*, or to give the firſt Movement or ntrance of the Formation of this Chaotical Sub-ance, in order from thence to raiſe a regular nd habitable Globe: His Spirit, moving upon he Face of the Waters, was the Exerciſe of his ower and Wiſdom, in firſt preſcribing them ch Laws as were neceſſary for the agreeable eparation and Diſtribution of the Parts one from nother into Order and Form as ſhould moſt armoniouſly anſwer the Purpoſes of Infinite Viſdom and Goodneſs to ſo ſublime an End.

VER. 3. *And God ſaid, let there be Light: And there was Light.*

§. 2. Now the Movement of the Spirit of God upon the Face of the Waters was the Beginning of the Exerciſe of his Power and Wiſdom in the modelling and forming that material Production, which he had before created and prepared for that Purpoſe, and which he now begins to bring into moſt beautiful and harmonious Order and Form, in order to fit it up for the Reception of ſuch Inhabitants as he intended to place upon it; who were to be compoſed of ſuch Elements as conſtituted its own Subſtance, which by an admirable Modification were to be incomprehenſibly qualified for the Reception of immaterial Exiſtencies, to influence that Matter with Perception, thereby to become active, and to receive Benefits from Senſation and Reflection thro' Material Organs: Hence it was firſt of all neceſſary that a Proviſion adequate to ſuch Purpoſe ſhould be firſt taken Care of; and as of all Things Light was the moſt pleaſant and proper Ornament, without which all other Furniture in the whole Fabrick would have been uſeleſs and have loſt their Beauties, and have remained in unobſerved Obſcurity: Therefore, firſt of all God commanded that there ſhould be Light.

§. 3. By this Command of Almighty Power all the Materials of which this chaotical State of Heaven

Heaven and Earth conſiſted, began to aſſume their proper Eſſences by a due Separation and Diviſion of Parts, ſo far as was neceſſary for future Purpoſes: And as we are aſſur'd that this Command had an immediate Relation to the Formation of this Globe, the Heaven and the Earth: And for ought we know to the contrary, and as it is, for Reaſons before given, probable, to all other Material Globes in the Univerſe, which might have the ſame Laws aſſign'd them at the ſame Time, according to their ſeveral Subſtances, and their Eſſential Properties and different Kinds; in all which the Laws of Gravitation and Attraction would ſeparate the groſſer from the finer Parts of their mixed and chaotical Subſtances: The heavieſt and groſſeſt Parts being fitteſt for the Baſis or Foundation of the Structure, are order'd by this Command, *Let there be Light*, to recede towards the Center, and to take their Places according to their Specifick Gravities, as the different Materials of the whole had a greater or leſſer Degree of Connection and Conſolidation of Parts, ſo that, that Matter, which was of the fineſt and moſt homogeneous and tranſparent Kind muſt be forced uppermoſt upon the receding of the moſt groſs and ſolid opake Matter, which now endeavour'd, and where no external Hurry prevented, took their Places round and towards the Center.

And tho' we may ſafely conclude, that God could as well have created the Subſtance, and produced the Form at the ſame Time; yet we

find, that as the Inhabitants, design'd to poſſeſs it, were to have progreſſive Time the Meaſurer of their Proceedings, ſo God choſe to give eſtabliſhed Laws to Nature by his own Way of Progreſſion in his Works, in the fitting up the Habitation for their Reception.

Thus, by Way of Gradation, God firſt begins to lay the Foundation of this admirable Structure, by giving thoſe Subſtances that were the leaſt porous the greateſt Gravity, in order to take their Places neareſt the Center, thereby making the Foundation firm to ſupport the Building, and to raiſe up in the Superficies of the Structure ſuch uſeful Neceſſaries, as ſhould be commodious both for the Pleaſure and Support of its future Inhabitants.

§. 4. So that by this Law, eſtabliſhed by the Author of Nature, in the Beginning of this Formation, the groſſer Parts of Matter endeavour to divide from the finer, and upon the ſettling of the groſſer towards the Center, the finer and more pure Parts of the Air or Atmoſphere would naturally aſcend, as having the leaſt Gravity, and be ſqueeſed from the large Pores of the Chaos, which had equally contain'd them before; and ſo be raiſed in an equal Circumference round the Superficies of the ſettling Globe; and accordingly, as the groſſer gradually contract their Subſtances cloſer and cloſer together, ſo much more of the Air or Atmoſphere muſt aſcend and ſurround the outermoſt Solids.

So

So that upon God's very firſt Command, *Let there be Light*, Light naturally was admitted to the Superficies of the ſettling Globe, upon the firſt Movement of the ſaid eſſential Law of Nature, when the different Materials of the Chaos began to aſſume their proper Eſſences, and to take their Places of Reſidence accordingly; for hereupon ſome ſmall Portion of Air became ſeparate from the groſſer Materials of the whole Subſtance, before confuſedly mixed, ſo that it was hereby made capable to receive the Rays of the Sun by Reflection, at leaſt to entertain them ſo far, as to give Light to the Surface.

Tho', at the ſame Time, according to the eſtabliſhed Laws in Nature, there would be ſo many earthy and watery Particles mixed amongſt the Air upon its firſt guſhing out from its old Reſidence, as would require further Time to clear them off, by a gradual Return and Settlement thro' the Laws aboveſaid, to produce a ſerene and clear Sky, and to admit the Sight of the Sun.

For notwithſtanding the Sun itſelf might not be of an older Date than this Heaven and Earth, yet as it was created a Globe for Illumination and Heat, and intended to enlighten and warm the other opake Globes belonging to its Syſtem, we may very reaſonably ſuppoſe, that its Formation might properly be adjuſted with, or near the Time of the very Creation of its Subſtance, and be ready prepared to afford, each of the Globes belonging to it, ſuch enlivening Comforts, that

ſhould, as a ſecondary Cauſe, promote their Formations in the Order preſcribed by Nature, as well as it has been ſince employed, as a ſecondary Cauſe, in her future Progreſs.

Verse IV.

And God ſaw the Light that it was Good. And God divided the Light from the Darkneſs.

§. 5. *And God ſaw the Light.*] This is ſpoken after the Manner of Men, to repreſent it, according to our common Conceptions of Things: By this Expreſſion we are inform'd, that it then became capable of being obſerved by ocular Perception at the outward Superficies of the Globe, ſo far as it was divided from the Atmoſphere by the aboveſaid Laws.

That it was Good.] This intimates and ſets forth the Uſefulneſs and Benefits which were to ariſe from it: That it ſhould anſwer the End that Infinite Wiſdom had appointed it ſhould ſerve to this habitable Fabrick, *&c.* which he had determined to furniſh with rational and ſenſitive Animals, for whom he not only prepares Habitation, but alſo provides neceſſary Furniture for their Entertainment and comfortable Subſiſtence; and as Light was firſt of all neceſſary, as the moſt pleaſant and comfortable Ornament, without which all other Materials, for further Furniture, would have been render'd entirely uſeleſs, and have loſt all their Beauties, as before hinted, in unob-

nobſerved Obſcurity; and could not have become a proper Receptacle for its intended Inhabitants: Therefore *Light* was the very firſt Ornament that was provided, as being abſolutely neceſſary to ſhew all Things in their proper Beauty, and to give them their proper Luſtre; that the Glories and Beauties of the ſucceeding Furniture might have their full and adequate Appearances, and their Uſes might be made plain and obvious, as well as that they might thereby be warmed, enlivened, and nouriſhed, as they ſhould hereafter gradually appear.

Thus the exceeding Uſefulneſs of it ſhews the Neceſſity of its Exiſtence before the Production of any Inhabitants, even, from the very firſt Beginning of the Formation of the Habitation prepar'd for them; and indeed, from the many and neceſſary Uſes and Benefits that muſt accompany it, and ariſe from it to the future Inhabitants, it muſt neceſſarily be, what God pronounc'd it, *very Good*: Good, in its Uſefulneſs, and proper in its Seaſon; and in its Seaſon only, for ſeveral Inconveniencies might attend its perpetual Continuance.

§. 6. For this Reaſon *God divided the Light from the Darkneſs*, and hereby alſo diſtributed the Light equally thro' the whole Globe; for by its conſtant Continuance upon any one Part of the Globe, it could only have illuminated one half of the Fabrick, and the other half muſt have remained in Darkneſs; and that Part thus

illuminated would have wanted the circular Returns of Nature's Refreſhments, which the continual Preſence of the Sun would have prevented, and the other Part would have been render'd an uninhabitable and terrifying Waſt; whereas by this Diviſion of Light from Darkneſs, the Uſefulneſs and Benefits of Light are diſtriboted thro' the whole Globe.

And this Diviſion of Light from Darkneſs would naturally enſue upon the Earth's Annual Revolution round the Sun, which whether that commenced in its chaotical State or no, I ſhall not pretend to aſcertain, but upon the Commencement of Light, and its Diviſion from Darkneſs, upon the Beginning of the Earth's Formation, it is plain it had an annual Motion, ſince the Diviſion of Light from Darkneſs muſt owe its Original to ſome Motion either of its own, or of the Luminary that enlightens it; but as it is now acknowledged by the moſt Judicious, for very good Reaſons, that, I think, amount to a Demonſtration, that the Sun is the Center of our Syſtem; and that our Earth is a Planet revolving about it, I ſhall take the Liberty to ſpeak of it as ſuch, without a Repetition of the Arguments that have been uſed to prove it.

And that its annual Revolution only would give this Diviſion of Light from Darkneſs here mention'd is plain to any intelligent Perſon, as equally as it is ſtill enjoy'd by its diurnal Rotation; and that it might be the only Motion it at firſt had, I think, I have, at leaſt, made probable

in

in my two Volumes of Philoſophical Meditations, to which I refer the Curious.

But as the * Equality of Light and Darkneſs, ſince the Commencement of the Earth's diurnal Rotation, is ſtill almoſt as juſtly preſerved, and thereby the Neceſſities of our relapſed State truly anſwer'd; I ſhall here conſider it under the Situation which we find it in at preſent, of its diurnal Rotation.

This, together with its annual Revolution, gives us Days, Weeks, and Months to conſtitute the Year, and from the Commencement of its diurnal Rotation, the Poles, being placed oblique to the Plain of the Ecliptic, gives us the four Seaſons of the Year, neceſſary for our preſent Circumſtances, of Spring, Summer, Autumn and Winter; and, as under the Equinoxial Line they have a conſtant Equality of Days and Nights, ſo as the Diſtances gradually recede from thence to the Poles, the Lengthening or Shortening of Days and Nights are leſs or more, according as they are more or leſs diſtant therefrom; yet ſtill an Eqnality thro' the whole Globe, if taken the Year throughout, is as nearly obſerv'd as the Excentricity of the Earth's Orbit will admit of, which confers on the Northern Hemiſphere ſomething more Day than Night in the Year, and *è contra*; ſo that tho' the more remote Parts from the Equinoxial towards the

* That is, the Preſence or Abſence of the Sun, Twilight not obſerv'd.

Poles

Poles, lie under ſome Extremes of not enjoying Day and Night every twenty four Hours thro' the Year, yet as much as they want it in one Part of the Year, they have it made good in the other.

Under the Poles therefore, Night and Day are each half a Year long, which has (ſince our fallen Eſtate) render'd thoſe Parts and adjacent Places incommodious for Inhabitants, from that ſhocking Change that Man's Deviation from Original Purity brought upon the Creation of this Globe; for before the Fall of *Adam*, (as I have endeavour'd to prove reaſonable in my Philoſophical Meditations before referred to) the Earth had only an annual Revolution, and that therefore this Equality of Days and Years was diffuſed thro' the whole Earth: And, I humbly conceive, that I have therein made it appear probable that theſe Inconveniencies, which now appear to render ſuch a State incommodious, were not Inconveniencies, but the contrary, to a Paradiſaical State, and what render'd the whole Earth an equal Paradiſe.

§. 7. But as our Change from Purity to Impurity and Diſorder, has render'd every Thing decaying to the preſent Union of Body and Soul, ſo now different Climates ſhew their different Clemencies and Inclemencies; and different Seaſons their Varieties of Exceſſes in Calorific and Frigorific Qualities, thro' the more or leſs Preſence or Abſence of that glorious and enlivening Lumi-

Luminary, the *Sun*, whoſe Spirituous Light and Heat being entertained in our Atmoſphere, and incorporated therewith, is appointed by its Creator to be the Support of both the Animal Inhabitants, and Vegetable Productions thereof.

But, in our preſent degenerate Eſtate, we could never have enjoy'd complete Happineſs, for which God doubtleſs deſign'd us, when he created us, ſince in the creating of us he could have no Views of advancing himſelf (as is fully prov'd in my Chriſtian Philoſopher, lately publiſhed) therefore, upon Man's Deviation from his original Purity, to reſtore him again it was abſolutely neceſſary to change that firſt State of Nature, which admitted no Decay to the Conſtitution of Life, or Union of Soul and Body, in order to bring us, thus degenerated as we are, from Impurity to another State of Perfection; from which, by our Arrival there thro' the Shadow and Night of Death, we could not revolt; becauſe here, by an Eſtabliſhment in Virtue from a peremptory Choice, in Oppoſition to our depraved Natures, which would incline us to Vice, we here maintain'd a continual Warfare, becoming Conquerors, thro' our mighty Deliverer Jeſus Chriſt; we are therefore put into the peaceable Poſſeſſion of our Conqueſts over Vice, and made Partakers of ſuch unmoleſted Joys, which no Enemies can ever break in upon to diſturb; for thro' a Separation of the preſent Union of Body and Soul by Death, the Conteſt between the Fleſh and Spirit will ceaſe; and we

ſhall

ſhall then continue, with unſpeakable Pleaſure and Satisfaction, that Approbation which we have made of Religion and Virtue, contrary to our Senſual Inclinations, that will for ever confirm us in the happy Choice we here made, having all thoſe Impediments and Interruptions which we here ſtruggled under, totally removed.

COROLLARY.

How inviting then muſt this be to our leading a Life of Holineſs, and to our ſtriving after Perfection, in order to attain it! The frequent Returns of Light and Darkneſs, of Heat and Cold, of Summer and Winter, are become neceſſary to our preſent State; and ought alſo to be our Monitors to awaken us to an Aſſurance of our having here no eſtabliſhed Abode, and that it was out of Love and Pity to us that God removed the Tree of Life from us, and drove us out of Paradiſe, that we ſhould not eat thereof, becauſe we had by Diſobedience chang'd the Purity of Nature in her firſt Productions; ſo that to ſubject us to Mortality, and prevent our living here for ever in ſuch Miſeries, as the Effects of Sin muſt neceſſarily render all thoſe rational Beings, who ſhould be involv'd in it, was a Puniſhment abſolutely neceſſary to fallen Man's Reſtoration; for it was impoſſible he could ever have been happy, had he liv'd for ever in his fallen Eſtate: Tho', when this Puniſhment was inflicted, it was likewiſe impoſſible, that Man could ever ranſom himſelf from

from Death, or recover himſelf from the Grave: But, behold the tender Mercies of our compaſſionate Creator! who, when fallen Man was in this woful Caſe, promiſes that his only Son ſhould become Man alſo, and in an human Body ſhould perfect an unerring Obedience, and ſhould notwithſtanding ſuffer Death only due to Sin, of which he would never himſelf be guilty: Therefore he could not die for himſelf, nor could Death have Dominion over him, ſince Death is only due to Sin; and as he could not die for himſelf, he died to make an Attonement for the Sins of all Mankind; and as Death could not hold him, becauſe ſpotleſs in himſelf, therefore by his Reſurrection he has broken the adamantine Bars and Bolts of Death, to reſtore us to a Redemption from Death, and a Reſurrection from the Grave, and to bring us again from the Darkneſs of Sin and Death to a Capacity of receiving both Light and Life eternal.

Who can juſtly meditate on theſe ineſtimable Bleſſings, and not be filled, not only, with a flaming Ardour, but an elevated Love, and Gratitude to God? What amazing Goodneſs is it, that he ſhould not withold his Son from dying for us, that he might thereby make our Puniſhment of Death the only Means to bring us to eternal Life, and endleſs Bliſs and Happineſs, and, even, Light eternal; when we ſhall have no more Occaſions for a Diviſion of Light from Darkneſs, but be made capable to bear the Perpetuity of everlaſting and uncreated Light, beyond the Com-

Comprehenſion of all our preſent Reflections from our moſt acute Senſations?

Let us then, the Sons of *Adam*, behold and admire the Indulgence of the Almighty, who, in the very Puniſhment inflicted on *Adam*, and thro' him on his Poſterity, has made each of us capable of making an Advantage of his Miſcarriage, even by the Fulfilling of the Puniſhment of Death threatened to his Tranſgreſſion, which could not have been accompliſhed by reverſing the Sentence; ſince, as above obſerv'd, had he been permitted after his Fall to have eaten of the Tree of Life; and liv'd for ever, he muſt for ever have been in a miſerable State; becauſe he would for ever have been the Subject and Servant of Sin; and Sin will ever render all its Subjects and Servants incapable of any complete Happineſs; and whatever is incapable of true Happineſs muſt needs be ſubjected to Miſery and Darkneſs of Underſtanding in the Midſt of all Advantages of temporal Light.

But when the Spiritual Light of the Mind was totally eclipſed, and darkened by Sin and Diſobedience, and when Man was not qualified to renew or reſtore himſelf; his merciful Creator's infinite Goodneſs appear'd to redeem him, and again to bring him from Darkneſs to Light, and hereby, as in a Simile, making the Darkneſs and Shades of Death the very Means to bring us into the true Light, and which we may as ſurely expect, as the Return of the Light of the Sun after the Shades and Darkneſs of the Night, ever

ſince

ince God's dividing the Light from the Dark-
eſs, and pronouncing them both *Good* in their
ucceſſion: So our Puniſhment by Death is the
nly Means to bring us to our promiſed Redemp-
ion, to deliver us from the Shades and Darkneſs
f Sin, without future Returns, and to bring us
o immaterial and eternal Light in Holineſs and
erfection; not capable of any more Separations
y intermitting Darkneſſes; for tho' Returns
hereof were pronounced Good in a Paradiſaical
tate, yet our Entrance upon a future State will
or ever diſcharge us, not only from the preſent
ccaſions which we are under ſince the Fall,
ut alſo from all ſuch as were neceſſary for the
nion of Body and Soul in *Adam*'s firſt Purity
ncorrupted; for then the Diviſion of Light
rom Darkneſs was ſuitable and neceſſary to that
tate, and therefore, even, in that State divided
he one from the other.

Let us therefore wait for our Deliverance from Sin and Miſery, by dying to Sin in this Life, that we may hereafter be raiſed from temporal Death and Darkneſs to eternal Life and Light.

CHAP. III.

VERSE V.

AND God called the Light Day, and the Darkneſs he called Night: And the Evening and the Morning were the firſt Day.

§. 1. Now

§. 1. Now when God had commanded, *Let there be Light*, and the Light, as above obſerv'd, commenced from thoſe Laws that his Command gave to Nature, at firſt, to make Way for its Reception, thro' that Proviſion which God had made of the glorious Luminary of the Sun, ready prepared to afford it, when God's Spirit moved upon the Face of the Waters to give the created Subſtance of the Heaven and the Earth the Laws of a due Separation of the Elements, before mixed together in chaotical Confuſion; and as the Light was hereupon render'd capable of being viſible to ocular Perception; ſo, as long as it remain'd in the firſt Hemiſphere from the Horizon where it made its firſt Appearance, till its Removal by the Earth's Motion or Motions, to the oppoſite Part of the Globe; God calls this Light by the Name of DAY; and on its Diſappearance from thence, when the Preſence of the Sun is thereby carried below the oppoſite Part of the Horizon, and Darkneſs enſues upon that Hemiſphere, which had firſt enjoy'd the Light; God diſtinguiſhes this Darkneſs from the Light of the Sun, by the Appellation of NIGHT; which were both uſeful and neceſſary in their Turns.

§. 2. Now where the Light was firſt commanded to approach the Meridian from the firſt Horizon, let the Admiſſion thereof be upon what Part of the Globe ſoever it will (as we may probably ſuppoſe it to reſpect the Garden of *Eden*, where *Adam* was firſt placed) there muſt neceſ-

ceſſarily be a Morning in the firſt Appearance
f it; and, by the Earth's annual Motion, ſup-
oſing it to have no other Motion *then*, the Even-
g muſt ſucceed: But ſuppoſing it had its di-
rnal Rotation alſo at that Time, yet it would
e the ſame as to this: For the ſame Separation
f Light and Darkneſs, Day and Night, as natu-
lly ſucceed each other, whatever was the Con-
nuance of it, whether longer or ſhorter.

§. 3. Now in the common Acceptation of the
Word *Day*, we commonly reckon a *Day* natu-
l, to conſiſt of one Revolution of the Sun's
eſence and Abſence, from the Motion or
otions of the Earth, whether joined together,
now, or ſeparate, when we might only ſup-
ſe it to have an annual Revolution without a
urnal Rotation; ſo that one natural Day, begin
at what Part thereof you will, all agree, is
mpleted from any Poſition of the Sun to the
ne Poſition thereof again; as from Sun-riſing
Sun-riſing, or from Sun-ſetting to Sun-ſetting;
from Noon to Noon, or from Midnight to
idnight: And tho' theſe are variouſly made
ſe of not only by different Countries, but alſo
Men of different Arts and Sciences, and of
ferent Perſwaſions in Opinions and Judgments
ncerning the Beginning of their Days; yet it
ſufficient to me that they all agree, that one
evolution of the Sun, by the Earth's Motion,
hich completes one Day and Night, conſtitutes
e Natural Day: Agreeable to which God

here calls the *Evening and Morning the firſt Day.*

That is, when the Light, which he firſt commanded to approach that Part of the Earth which would then have the Sun in the Horizon and gradually aſcending to its Meridian, it would afterwards as gradually deſcend to the contrary or oppoſite Part of the Horizon, and leave the firſt illuminated Hemiſphere in the Shade, to whom that Day of Light is concluded, and Darkneſs divides from the next Day, which Darkneſs, tho' called Night, yet breaks not the Natural Day into two, but one Natural Day is pronounced from Evening and Morning, which tho' diſtinguiſhed by Day and Night, Evening and Morning, they only make up one Natural Day, the firſt Revolution of which, God here calls *the firſt Day*: And thus the Four Seaſons of Spring, Summer, Autumn, and Winter conſtitute the Year's Revolution.

§. 4. It has been, and is now common among the *Jews* and ſome others, from the Evening here being mention'd before Morning; *And the Evening and the Morning were the firſt Day*, to begin their Days at Sun-ſetting, or the Evening becauſe the Evening is here mention'd before Morning, imagining from thence, that the Days Works of the Creation were begun in the Evening of each Day. But I do not ſuppoſe that *Moſes* intended he ſhould have been ſo underſtood; for I apprehend, that *Moſes* here repreſent

ſents the Works of God to be begun in the Morning; for when he ſaid, *and the Evening*, that is, when God had perform'd what he intended for the Operation of the firſt Day, the Evening enſues upon it, and then no more Work was proper to be begun till the Commencement of the next Day, or Morning thereof, and therefore he adds, *and the Morning were the firſt Day*, thereby including the ſucceeding Night into the Natural Day, but no Obſervation of Work is taken Notice of therein, thereby intimating that that Part of it was appointed to Reſt.

§. 5. And if we would accompany the Beginning of the Day round the Globe to every Part thereof, the Approach of Light to every different Longitude or Meridian may be conſidered as the Beginning of the firſt Day to every Part when it was firſt received; and therefore the Day, as to God's Work, muſt be carried round the Globe, and ſo his Work continued, throughout the Natural Day, to the Beginning of the next Day's Work, where he began his firſt, which from hence I ſhall conſider as begun in the Morning, and carried on till the Evening in whatſoever Part of the Globe, and that the Evening where it approach'd is here mention'd as the Concluſion of the Day's Works, and the Morning the Time of the Beginning another; and therefore *the Evening and the Morning were the firſt Day.*

COROLLARY.

Hence let us learn, in the Morning of our Day of Life, with Diligence and Induſtry to illuminate our Minds with the true Light of the revealed Will of God, and purſue the Dictates thereof thro' that inward Light that always accompanies every Man, that comes into the World, and which gives to every one, at leaſt, a Law of Self-Preſervation, which muſt produce an Endeavour after Happineſs of both Soul and Body, whether join'd or ſeparate, and tho' the eternal Concerns of the Soul are of infinite Moment, and our preſent Concerns only tranſitory, yet the Duties enjoin'd us to render the preſent Connection of Body and Soul as eaſy and pleaſant as the preſent State of them can be honeſtly procured, are alſo conſiſtent with that Care we are enjoin'd for the future Happineſs of our Souls; ſo that our preſent and future Welfare are ſo interwoven, that we cannot do Violence to the one without doing Violence to the other.

And how agreeable is it, that the very Laws of Self-Preſervation, implanted in Nature, and honeſt Endeavours for a comfortable Subſiſtence in this Life, are not only lawful but Duties enjoin'd us, as well as conſtituted in the very Principles of Nature, and the Benefits not only to be enjoy'd in this Day of Life, but alſo for ever, when the Evening of our Day of Life overtakes us, and removes us, by the dark Shades of Death to a Reſt from our Labours!

Who

Who can ſufficiently admire the Goodneſs of God, who has thus joined our preſent and future Happineſs in ſo cloſe a Connexion, ſo that whatever tends to our future Welfare is never inconſiſtent with our preſent, as ſome have endeavoured to repreſent, and have thereby led away not only ſome weak Women, but I may ſay, ſome weak Men too, into a Diſregard of a proper Care for their own comfortable Subſiſtence, who have alſo left thoſe under their Care and Charge ſtarving, with Expectations of ſuch Proviſions from Providence, as God never promiſed ſhould be beſtowed on ſuch, who took not the proper Methods, preſcribed them, of Care, Induſtry, and Diligence, in the Ways and Spheres which each one was enjoin'd to obtain it, during his Day of Life?

Let us, then, ſpend the Day of Life in honeſt Induſtry, Care, and Diligence, and ſtrive to be able to aſſiſt the truly Neceſſitous, who, thro' the common Accidents of human Occurrences, have unwillingly become obnoxious to Want, and let us ſo join Religion and Virtue with the Law of Self-preſervation, that thereby our eternal Preſervation may be procured; ſo that, when we have finiſhed our Days Work of Life, our Evening thro' Death may conduct us to the Morning of eternal Day.

CHAP. IV.

VERSE VI.

AND God ſaid, let there be a Firmament in the Midſt of the Waters, and let it divide the Waters from the Waters.

§. 1. Now, as before obſerved, God having, upon his firſt Command, fixed eſtabliſhed Laws in the Order of Nature's future Progreſs, whereby the true Eſſences of every Species of the confuſed Chaos ſhould, from thoſe Laws, aſſume their proper Qualities, and, by their Specific Gravities, ſhould take their proper Diſtances round the Center of the Globe, the Air or Atmoſphere hereupon naturally takes Place in the outermoſt Superficies, and ſurrounds it; as being the fineſt, moſt homogeneous, and tranſparent Part of the whole Chaos; and thereby admits of ſome Rays of Light, as has been before obſerved, from its appointed Quality of being the only proper Medium, producible from thence, to collect, refract and reflect thoſe enlightening and enlivening Rays, that God had prepared to proceed from the central Luminary, the Sun; but upon the very firſt Eſtabliſhment of this Law, by the firſt Command, ſo many earthy and watery Particles would naturally accompany thoſe finer and purer Parts, in their firſt

rſt Separation, as would obſtruct that full ranſparency, which a ſufficient Separation ould admit, and which muſt require a further ime, by the aboveſaid Laws to clear themſelves om, and to this End, by a Continuation of the aw firſt eſtabliſhed, God commands the fu- ure Operations of his Works to ſucceed.

§. 2. And now the Waters, which took their ettlement in the Bowels and upon the Surface f the Earth are divided from thoſe Particles of Waters mixed with the Element of the Air and ecome divided One from the Other; in which Diviſion the Atmoſphere above is termed Firmament, which is here ſaid to divide the Waters from the Waters: So that the Waters gather'd together upon the Superficies, and thoſe promiſcuous Particles floating in the Atmoſphere are the Waters here ſaid to be divided by the Firmament; and the Waters in the Atmoſphere, which were thus divided from the Waters below, upon the Superficies, are what give a Weight to the Air, and its Weight at the Surface is, by our modern experimental Philoſophers, found to be 28 Times lighter than condenſed Water, and allowing it to grow more and more rare in Proportion to the Diſtance, as its Extent from the Surface is about 47 or 50 Miles, ſo we may ſuppoſe it, at leaſt, to conſiſt of a 28th Part of Water; for ſuppoſing the whole Atmoſphere reſolv'd into an Equality in reducing the Height of it from 47 to 28 Miles,

we may then consider it to bear throughout the same Weight it bears at the Surface, and then, as above observed, it being 28 Times lighter than Water, and 28 Miles surrounding the Surface, it would, at least, in condensed Water, afford as much as would be above one Mile deep round, supposing it to be perfectly orbicular without Hills and Mountains, which might in all Probability equal the Waters contain'd in the whole Earth and Seas, and so appear to be as near as well can be, an equal Division.

§. 3. I think it would be needless to repeat here the Notions of the Ancients, from these Words, who imagined a Celestial Heaven of Waters divided from the Seas by the Fixed Stars, whose Concave they conceived Material, and to be understood by Firmament; since the Phænomena of Nature has of late Years been rendered much clearer to intelligent Persons.

VERSE VII.

- *And God made the Firmament, and divided the Waters which were under the Firmament from the Waters which were above the Firmament, and it was so.*

§. 4. Now God's making the Firmament, by the Laws before noted, shews its being separated or lifted up round the settling Globe's Superficies, which it now surrounds, as with a Garment, and is properly appointed for such Uses

and

and Offices as would be neceſſary for the Purpoſes of ſuch Inhabitants, whom God deſign'd by his Power, Wiſdom, and Goodneſs to produce and place upon it.

So that, in this Second Day's Work, the great Deſign of this Globe's being prepared and made fit for the commodious Reception of Inhabitants is carried on and taken Care of, by this Diviſion of the Waters on the Surface from the Waters above; thoſe Waters below being not only deſign'd, as a proper Element for numerous Inhabitants, but alſo for manifold Uſes to ſuch, who ſhould alſo be ſuited to live in the Element above or open Firmament.

Thus God divided the Waters, which were under the Firmament from the Waters which were above the Firmament. And it was ſo.

That is, the ſubſtantial Element of the Waters were divided from the more refined and pure Element of the Atmoſphere, wherein the rarified Particles of the Waters have their continual Communication, the Uſes whereof can hardly be ſufficiently comprehended, but muſt manifeſtly ſhew forth the unfathomable Wiſdom of the Creator and Adjuſter of his Works in ſuch admirable Degrees of Formation.

§. 5. For if the Waters had all been ſubſtantially condenſed and confined in one Body below, and had not had this Diviſion, and, thro' this Diviſion, a Communication between thoſe above and thoſe below, they would then not only

only have become uſeleſs and unſerviceable, but muſt alſo have ſtagnated, and have become an inſufferable Stench, and not have been qualified for any of the Purpoſes to which this Diviſion and Communication has render'd them.

By this Diviſion and Communication of the Waters above, and thoſe below, there is a continual Agitation of their Aſcent and Deſcent to each other, that keep them in a conſtant Purgation. By the Condenſation of the Waters above into Clouds, and their Returns in Rains, the Surface of the Earth is water'd and refreſh'd; and the Atmoſphere hereby alſo kept ſweet as well as the Waters below from entire Stagnation; and hereby all the rational and animal Inhabitants thereof enjoy the Privileges ariſing from thoſe Vegetable Productions, which this Concourſe renders meet for their Participation, and uſeful for their Support, *&c.* But without this Diviſion and Communication of the Waters above and thoſe below the Firmament, the Sun itſelf would not be able to exert its Qualities to any beneficial Purpoſes.

From hence all the various Phenomena of our Atmoſphere have their Riſe and Uſefulneſs, and where any of them have proved prejudicial it has proceeded from thoſe Changes that ſucceeded upon Man's Diſobedience, *&c.* of which ſee my *Phil. Med.* Vol. II. Sect. 2. and 3.

§. 6. By this Diviſion and Communication of the Waters below and above, we have likewiſe

wiſe the Admiſſion of Light and Sounds, by that due Proportion of thoſe pure and rarefied Particles of the Waters with the Element of the Air; for hereby it becomes capable of receiving, collecting, refracting, and reflecting the Rays of Light, by a certain Coheſion between the rarified Particles of the Waters and thoſe of the Air, which together, thro' their Coheſion and orbicular Figures, the Rays of Light are receiv'd curvilinearly by a Paſſage thro' their orbicular Coheſion.

And thro' the ſame Poſition of this Compound of pure Waters with the Air, it is, that Sounds are likewiſe propagated, and communicated by the ſtriking upon any Manner of Matter or Inſtrument, by giving thoſe cloſe connected and fluid Particles ſuch Motions by Concuſſions, which communicate them to the Organization of the Ear, from which, by repeated Experience, we can judge what Sort of Matter, Metal, or Inſtrument, is touched or ſtruck upon.

But the Progreſſion of Sounds is much ſlower than that of Light: For the Progreſſion of Light almoſt inſtantaneouſly ſtrikes thro' theſe Particles without any ſenſible Concuſſion or Movement of them; but Sounds are propagated by their Concuſſion and Movement, and have the ſtrongeſt Operation upon thoſe Particles, which are neareſt to the Matter, Metal, or Inſtrument, that is touched or ſtruck upon, and from thence where it firſt receives the Concuſ-

ſion

ſion it enters the ſtrongeſt, and communicates itſelf all around to the next Particles it falls in with, but continually decreaſes in its Force according to the Diſtance, and therefore takes up conſiderable Time to extend its Vibrations to diſtant Places, and grows weaker and weaker till it becomes extinct; but by any Current of the Atmoſphere, or Motion of the Wind, it is carried quicker, farther, and clearer to the Places it is thereby drove, and retarded and leſſen'd in its Motion and Sound towards the contrary Quarters: Yet, even, Light and Sounds, and the Manner how they are communicated are ſo far myſterious to us, that we can only obſerve from them, the unfathomable Wiſdom of the Author of Nature in the Creation and Production of them.

§. 7. And we may further obſerve his immenſe Wiſdom in adjuſting the Concourſe of the Waters below, and thoſe above the Firmament: Thoſe below are continually ſending up rarify'd Effluvia into the Atmoſphere or Firmament above, and the Atmoſphere above is as naturally making Returns, by condenſing thoſe rarified Effluvia, and collecting together innumerable Particles, and forming them into Clouds, by joining their watery Superficies, which incloſe a refined Air, that gives them their Aſcent; and by a Concuſſion in this Connection, the watery Superficies are broke, and the refined Air that ſupported them is let out, and the wa-

tery

ery Superficies that encloſed the Air by catch-
ng hold of one another in Multitudes together
ecome Drops of connected Water, and ſo muſt
eſcend thro' the Atmoſphere, becauſe they then
ecome heavier than the Atmoſphere wherein
hey were ſupported, by being broke off from
he lighter incloſed Air that had before ſupported
hem, and ſo carries along with them all that
hey ſhall meet with in their Way, not yet ſet
ff in the ſame Manner, breaking their Links
nd Chains in their Regional Reſidence.

And as there is throughout the Waters below
continual Agitation and Fermentation, always
ending up refin'd Effluvia into the Atmoſphere
r Firmament above, and mutual Returns made
herefrom, they are hereby kept in a conſtant
Rotation, and render'd every Way ſerviceable
o the Earth's Inhabitants, being perpetually
reſerved in due Order, fitted for, and con-
erted to, all proper Occaſions to which they
ould become qualify'd for uſeful Purpoſes.

§. 8. Thus Springs on high Mountains muſt
ave their Riſe, thro' that Agitation that the
Waters in the Bowels of the Earth muſt, from
he aboveſaid Laws, neceſſarily undergo; for the
Waters there being pent up, ſome Effluvia,
rom a due Warmth in theſe Receſſes, muſt na-
urally aſcend therefrom, which having no
pen Expanſion to riſe into, can only make
heir Way thro' the Pores and Caverns of the
Earth,

Earth, where they must become interrupted and condensed in their Passages, and therefore break forth into Streams where they meet with the freest Admission; or where there are the most Pores, or Caverns, as Veins for their Circulation, which the most hilly and mountainous Countries are frequently stocked with.

And, by this Communication, the Bowels of the Earth are, even to the Surface, continually refreshed, and the Metals and Minerals therein nourished, so that both in the Earth and Air the Waters have that continual Agitation and Circulation that preserve both in due Order, and is to each as the Circulation of the Blood is to animal Life.

Verse VIII.

And God called the Firmament Heaven: And the Evening and the Morning were the Second Day.

§. 9. Now the Waters below and the Waters above were thus divided, and the Atmosphere or the open Air was fixed above the common Superficies of the Earth, and the Receptacle of the condensed Waters which had their Current and Abode in the lower Parts of the Earth's Surface: These Waters below were to keep a continual Concourse with the Atmosphere by sending up Effluvia thereunto, that from thence it might receive such Returns as were necessary to preserve the Phenomena thereof in a Chain of perpe-

perpetual Concord in this firſt Production of Nature.

§. 10. This Atmoſphere above, wherein the Waters are ſaid to be divided from the Waters below, God called *Heaven.*

Which Word *Heaven,* in our *Engliſh* Language, is moſt fitly framed and made Uſe of to anſwer what is thereby ſignified, and might therefore be properly underſtood by our Forefathers, who firſt tranſlated or introduced that Name for it into the *Engliſh* Language; which appears to be from the Verb, to *heave,* or lift up; ſo that the Name *Heaven,* in the old Way of *Engliſh* Expreſſion, is the ſame which we now call *heaved,* or *lifted up,* which, tho' we have now changed the *n* for a *d* in our common Way of uſing it upon other Occaſions, yet we retain the Name of the Atmoſphere as formerly given to it, till it is almoſt forgotten from whence it was derived; for being in former Times fixed for the Name of our Atmoſphere, as heaven, or heaved or lifted up from the common Surface; ſo the old Word, *Heaven,* is ſtill continued and made uſe of in our modern *Engliſh,* to ſignify our Atmoſphere or Firmament.

So the *Latin* Word *Cælum* is generally underſtood to ſignify the Sky, or State of the Atmoſphere or Weather, as well as an Heaven of Happineſs.

And

And ſo it is, that we make Uſe of the very ſame Name *Heaven* for the Receptacle of departed Souls of the Juſt, of Angels, and of the Throne of God and the Lamb, CHRIST JESUS, upon his Aſcenſion; and which is as natural and ſignificant, as when apply'd to our Atmoſphere, tho' there of a more ſublime Signification, and is therefore ſometimes called the *Third Heaven*, as in a Superlative Degree, ſo the Heaven of Heavens bears the ſame Senſe and Significancy, and is to be underſtood in a Spiritual Way, as being *Heaven*, viz. heaved, or lifted up, above the common Senſations of Mankind in their preſent State and Circumſtances, and therefore in that Senſe as properly called Heaven, and according as it is made Uſe of, in the Scriptures or elſewhere, it is to be taken and underſtood from the Deſign of the Writer, and according to the Intention for which he uſes it.

And the Evening and the Morning were the Second Day.

Of this ſee the Concluſion of the Firſt Day, which may ſuffice for the Concluſion of every Days Work of the Creation.

CHAP.

CHAP. V.

VERSE IX.

AND God said, Let the Waters under the Heaven be gathered together unto one Place, and let the dry Land appear: And it was so.

§. 1. Now here again is a Continuation of the first Laws established in the Order of Nature to carry on and complete this admirable Structure, and therefore by Approbation (as it were) of Nature's Progress in her first Performances, God here commands, that by the same Laws whereby he had laid the Foundation of the central Parts of the Globe, and had raised the finest Parts uppermost, and had divided them from the outermost Superficies of the terraqueous Orb of the Earth, which still remained overspread by the Waters, which were yet gushing out of the Superficies, by the continual settling of the earthy Particles at the Surface, which according to their Specific Gravities, not being borne down with any other more heavy than themselves, they must require a proportionate Time to fix and thoroughly to settle; and the Waters must therefore be as gradually dislodged from their confused Mixtures with the whole, before, chaotical Substance: And upon

this Settlement of the Earth's Surface, the ſuperfluous Quantities of the Waters mixed with the Earth would be thereby thrown out, and only ſuch Parts of the Waters remain in the Bowels of the Earth, as were neceſſary, as before obſerv'd, for the Preſervation thereof in that due Order and Decorum, which it muſt certainly otherwiſe have wanted: And the Waters, that now take their Reſidence on the loweſt Parts, or Places of the common Superficies, were to be employed for wiſe Ends and Purpoſes, and by being gathered together into one Place, as a Store-Houſe for a continual Communication and Concourſe with the Waters above in the Firmament, as obſerv'd in the laſt Days Work, they hereby become uſeful upon innumerable Occaſions to the Inhabitants of the dry Land, as well as to thoſe that are only ſuited to the Waters themſelves; and alſo by this Separation of the Waters from the dry Land, and their Communication with thoſe in the Firmament or Atmoſphere, the Inhabitants of the dry Land are furniſhed with ſuch Products of Fruits, Vegetables, &c. of which this Concourſe of the Waters above and below, is *one* of the abſolutely neceſſary ſecondary Cauſes of Production and Continuation.

For the Uſes of the Waters, both upon the Earth's Surface, and thoſe in the Atmoſphere or Firmament, are ſo adjuſted by their continual Rotations, that they perfectly anſwer all the Occaſions of the Inhabitants of the animal Crea-

Creation, belonging to this whole terraqueous Globe.

§. 2. And this Collection of the Waters muſt alſo be adjuſted by the Wiſdom of God in ordering one Part of the Globe to be elevated above another, in a ſmall Degree from the Center, which, as I have obſerved in my *Philoſophical Meditations*, Part. I. Sect. 4. were ſo appointed by infinite Wiſdom from conſtituting an unequal Diſtribution of Parts in that chaotical Fluid, from whence it was formed; for that it had an unequal Diſtribution of Parts, in its entire Fluidity, will appear from the different Diſtribution of Metals and Minerals, which are differently diſtributed thro' diſtant Parts of the Globe, and therefore took their Settlements in different Poſitions round its Center, and ſo left higher and lower Places upon the Surface of the Earth, and therefore to the loweſt Parts of the Surface, the Waters, diſlodged from the Earth's Bowels, muſt neceſſarily make their Current, and be gathered together into this Receptacle, thus prepared for them.

And, as in the former Day's Works, the ſeveral Solids, as Earth, Stones, Metals, Minerals, *&c.* had aſſumed their eſſential Properties, and, as near as the Hurries in their Settlements would admit, had taken their Places according to their different Gravities; ſo that which ſtill retain'd the true Eſſence of Water, thro' its Fluidity, was ſqueeſed out above the ſubſiding

Solids ſo far as it was neceſſary to be ſeparated from them; ſo that in this Third Day's Work, their Riſe, from all Parts and Pores of the Earth's ſurrounding Superficies, would naturally continue to cover its whole Surface, notwithſtanding their Current and Deſcent from all Parts to their common Receptacle or Storehouſe, till the ſolid Superficies, by a ſufficient Settlement, had diſlodged thoſe Fluids from the Harbour they before were confuſedly incorporated with; upon which Diſlodgement, they muſt, according to that natural Gravity given them in theſe eſtabliſhed Laws, by their Fluidity, deſcend in a Current or Currents to thoſe Parts of the Globe, where the Superficies thereof were the moſt depreſſed, and recede from thoſe, which were more elevated, and ſo become a Body of Waters gathered together into one Place, or into ſuch proper Receptacles as would ſuit all the Purpoſes that infinite Wiſdom had deſign'd them to anſwer: And hereby alſo the dry Land is cleared from thoſe Waters, and made fit for the Production of ſuch Fruits, Vegetables, *&c.* as were neceſſary for the Pleaſure and Support of ſuch Land Animals, as were deſign'd to poſſeſs it, as well as made a fit Receptacle for them.

And thus the dry Land was now prepared and fitted for the Production of all manner of Fruits, Grains, Vegetables, *&c.* the Waters under the Heavens being gathered together.

And it was ſo.] Thus was that Law, which God's Command gave to Nature ſtrictly obey'd in Nature's Progreſs, which neceſſarily proclaims the infinite Power and Wiſdom of the Author, who both created and eſtabliſhed ſuch Laws in Nature, which our finite Capacities can never fathom nor ſufficiently admire.

VERSE X.

And God called the dry Land Earth, and the gathering together of the Waters called he Seas: And God ſaw that it was good.

§. 3. Now as the Names of Earth and Seas are alike received and underſtood by all, I ſhall not trouble myſelf to make any critical Explanations of the Words or Names thereof: Since by *Earth* is always underſtood a Place free from Waters, ſo as to render it fit for the Purpoſes of dry Land; and by Seas, a Collection or gathering together of the Waters: And as no Miſtakes of the Meanings of theſe Names are likely to ariſe, I ſhall proceed to make ſome Remarks as Inferences from what has been hitherto obſerv'd in this Beginning of the Third Days Work.

COROLLARY.

When I meditate upon the unfathomable Wiſdom and Power of that infinite Exiſtence, that was the Creator of theſe incomprehenſible,

and yet harmonious Concords in the Eſtabliſhment of the Laws of Nature, I am aſtoniſhed and Wonder ſtruck, even, by the ſmall Glimpſe I can diſcover thereof: How unſearchable muſt be the Depth of the inexpreſſible Power and Wiſdom of the great Author of Nature, which, even, to our ſcanty Capacities, clearly ſhines in every Step of his Workmanſhip?

Does not this fully declare the Impoſſibility either of their Exiſtence or harmonious Order, without ſuch an Author of infinite Power and Wiſdom to create, form, and fix ſuch eſtabliſhed Laws in their firſt Productions and Formations, which are ſo amazingly curious, and harmoniouſly adapted, as will for ever exerciſe our moſt elevated Underſtandings with pleaſing Wonder and agreeable Amazement?

Let us then be content to behold, that all his Works are perform'd by ſuch unſearchable Power, and unfathomable Wiſdom, as that we muſt acknowledge they are paſt our Capacities to comprehend; and therefore ſatisfy ourſelves at preſent with ſuch ſmall Rays as we are here able to collect of them; and acknowledge his Alſufficiency to perform them, and our own Inability fully to underſtand them; and therefore render to him only in his Divine Exiſtence, the Kingdom, Power, and Glory, for ever and ever.

CHAP.

CHAP. IV.

VERSE XI.

AND God ſaid, Let the Earth bring forth Graſs, the Herb yielding Seed, and the Fruit Tree yielding Fruit after his Kind, whoſe Seed is in itſelf upon the Earth: And it was ſo.

§. 1. Now the Earth, being cleared from the Overflow of the Waters, was rendered capable of producing whatever that Almighty Power, which firſt created and afterwards had formed it, ſhould ſee Wiſe and Good to command it to bring forth, and in ſuch Wiſe as his Command ſhould appoint.

And as God had determined both before the Creation and Formation of the Earth to furniſh it with Fruit Trees, Vegetables, and the like, for the Uſe of ſuch Animals as he purpoſed to place upon it; ſo, no Doubt, in the very Creation of its Subſtance the Seminal Materials of Man, Animals, and Vegetables, had their Creations in their various Seminal Properties; ſo that the Varieties of ſuch Fruits and Vegetables that would become uſeful to the Earth's future Inhabitants had the very Eſſences of their Beings conſtituted and appointed in the very Creation of the Chaos, and adjuſted to anſwer his Appointment in the Laws he eſtabliſhed in Nature's

future Productions; ſo that now upon his Command they naturally aſſume their proper Appearances, and do his Will without any Perception in themſelves of the Action; for thoſe unfathomable Laws in Nature, throughout the inanimate World, for ever perſevere in the firſt Order of their Eſtabliſhment, without Deviation, having no Will to oppoſe their own Perſeverance therein.

Hence appears the Harmony of the inanimate Beings and Globes of the Univerſe, which can never be ſufficiently found out or expreſſed; or admired ſo far as it already appears. And if all inanimate Beings are confined to the ſtricteſt Rules of Concord and Harmony by the neceſſary Impulſe of Obedience to the eſtabliſhed Laws in Nature, then there can be no Deviation from the Law of God, but by a wilfull oppoſing Force in Rational Beings who from their Rationality are made ſelf-active, and therefore free Agents, and under no impulſive Force of Obedience. Therefore Mankind was the only Inhabitant upon this Globe capable of Diſobedience: The Effects of which, tho' he did diſobey, thro' God's amazing Goodneſs has been changed, and Man again made capable of greater Advantages by that Loſs, as has been before conſider'd.

§. 2. Now, as above noted, whatever Graſs, Herbs, Fruit-Trees, *&c.* have been produced from the Earth's Surface, were from Something created

reated in the Conſtitution of the Chaos to ren-
der it pregnant of ſuch Productions, as alſo in
ll other Caſes of the Productions of Animals, &c.
And theſe firſt Productions being once brought
orth, the future Progreſs of their Continuation
nd Encreaſe were to be upon the Dependance
f their ſeveral Seminal Properties in themſelves,
o that in every different Herb, Fruit-Tree, &c.
he Fruit of each, which come to Maturity, do
lways retain that Seminal Property to produce
heir own Kinds in their different Varieties.

Now the firſt Production of Graſs, Herbs,
ruit-Trees, &c. would undoubtedly be in a
aſt Variety and Plenty, more than ſufficient
or the Entertainment and Satisfaction of the
irſt Inhabitants, deſign'd for their Enjoyment;
nd it would be ſufficient for that Purpoſe, if
he firſt Productions were only on that Part of
he Globe, where the Land Animals were to
nake their firſt Appearance, it being only ne-
eſſary to furniſh that Place the firſt, which was
irſt to be inhabited.

And that it was ſo order'd, I think may ap-
ear, *Firſt*, From God's putting the firſt Man
nto the Garden of *Eden*, where the firſt Pro-
uctions of Fruit Trees and Vegetables are ſaid
o be in ſuch vaſt Variety, Plenty and Beauty;
where his only Appointment was to dreſs and
keep the Garden; which muſt imply Something
o be done by the Man in the Garden, and what
more probable could it be, than his taking Care
hat the Trees and Herbs did not in their future
Growth

Growth prove detrimental one to another; and likewiſe to plant and ſow the Seeds and Fruits of Herbs, Vegetables, Fruit-Trees, &c. in order for their Multiplication according to the Encreaſe of the Inhabitants, which, in that State, would only have been a Work of Pleaſure and not of Toil?

Secondly, To have created theſe Things in all Parts of the Earth at once, they muſt entirely have remained uſeleſs, and have only become cumber Grounds, which we cannot ſuppoſe agreeable to a State of Purity in the firſt Production, for upon a Suppoſition of theſe Things created in all Parts of the Earth, not one ſingle Tree or Vegetable in ten Thouſand would have been any ways ſerviceable. Therefore,

Thirdly, All manner of Fruit-Trees and Vegetables being created with their Seeds in themſelves to produce their own Species, it would have been very unneceſſary to have furniſhed the Earth altogether at firſt with them, ſince it was not intended to be ſo furniſhed with Inhabitants; it would, therefore, be unneceſſary to furniſh more than one ſufficient Plat of Ground, and *Moſes* informs us, that the Garden of *Eden* was the firſt Place thus furniſhed. So that,

I think it moſt reaſonable to imagine, that no more of each Kind of Herbs, Vegetables, and Fruit trees, were, at firſt, produced, than what the firſt Inhabitants might find ſome Occaſions and Uſes for, or Enjoyments in (for, even, the Tree of Knowledge had its Uſe whether our

firſt

first Parents had eaten of it or not, because thereby Man's Obedience was tryed) I say, the Seeds of each Herb, Fruit-tree, or Vegetable, being in themselves, were always ready at Hand to multiply their Species according as the Multiplication of the Inhabitants should require, for the Multiplication of every Kind was as ready to be procured, as the Encrease of the Inhabitants could have Occasions for them.

It may indeed be said, and may be allow'd, that God could as easily have created these Things all over the Globe at once, as in one Place, and in the first State of Purity have created them so perfect, as to have admitted no Decay, and therefore to have wanted no future Multiplication or Product.

But this would have been contrary to the End and Design of the whole Material Creation, since a Seminal Propagation of the Species of both Vegetables and Animals was from the first, designed to succeed the Creation of the first Originals.

§. 3. Thus, if we were to enquire, even according to our present Conceptions of Things, whether it would have appear'd more Wise that God should have created all Men, and other Animals at once, which would have been similar to the Creation of all Necessaries for them at once, without any further Encrease of their Species.

This

This Enquiry, methinks, at first Consideration, would appear to Natural Reason to be much beneath the Wisdom, that has otherwise established the present most beautiful Order of Nature; for supposing the whole Multitudes of the Human Species to have been created together, several Inconveniencies must have ensued. As,

First, The whole Earth, in such a State as they were created in, could not have contained them; nor the Fruits and Vegetables necessary for their Sustenance; or they must have been made vastly different from what they then were, or now are.

Secondly, Supposing Mankind to be thus created, and yet created as they then were, with Reason and Free-Agency, they would all have been liable to disobey their Creator, and it is reasonable to suppose, that some would obey and some would disobey; but in this Case, there could be no Provision for the Recovery of those who should disobey; as in the Case of the fallen Angels, who succeeded not each other by lineal Descent; since no Mediator in such a Case could have become incarnate in their Natures, and undertaken to die for their Transgressions, and intercede for the Remission of them, and thereby to recommend them to the Favour and Acceptance of their Creator again; but they must unavoidably have remain'd under that Sentence, which was the necessary Result of their Disobedience.

But

But tho' many other Inconveniencies might be enumerated that would have attended such a Creation, yet, it may be sufficient to my present Purpose, I presume, to consider the Wisdom and Goodness of God in the Method of Man's Creation, and his Appointment of the Encrease of the human Species by lineal Generation in future Successions.

For, now, tho' Man was created one Male and one Female at first, and commanded to be fruitful and multiply, and replenish the Earth, and thereby to introduce an innumerable Progeny into the World, of whom they must therefore be the first Parents, and tho' they should violate the Law given them, and the Natures of their Posterity should thereby be inclined and subjected to Sin, yet they being innocent of their Transgression, would have a Right from a righteous and merciful Creator to expect sufficient Means of Restoration; for as one Man was at first only created from whom all his future Progeny derived their Existence, such future Progeny must be entirely incapable of guarding themselves against that Disobedience which he might fall into; and it would have been Injustice in his Creator, which he can never be guilty of, to impute the Sins of his Posterity to them, which were merely occasion'd by the Corruptions they had derived from him, without affording them sufficient Means for their Redemption.

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We may aſſure ourſelves therefore, that had not God purpoſed to redeem him and his Poſterity, that he would immediately have inflicted the Puniſhment of Death upon *Adam* when he tranſgreſſed, rather than that his innocent Poſterity ſhould unavoidably and irreverſibly have been involved in the Execution; for this muſt be an unerring Concluſion from a true Senſe of the infinite Goodneſs of God, whoſe tender Mercies are over all his Works.

§. 4. But as to the Caſe before us: As Herbs, Vegetables, and Fruit-trees were ſo created, that a Continuation and Encreaſe of them were to ſucceed from the Seed in themſelves; ſome have from thence ſuppoſed, that all future Productions of them were in the very Seeds of the firſt, and that every Seed thereof contain'd (in a long Series of Diminution) all ſuch Productions as have enſued, or ſhall for ever enſue therefrom.

But as I cannot give my Aſſent to this Hypotheſis, I ſhall offer ſome Reaſons for my Rejection of it.

Firſt, 'Tis ſufficient that Fruits, *&c.* have always the Seeds in themſelves of their next Products, thereby to communicate that ſame Property to their next Progeny, and they to their next, *&c.* for they can be no longer ſuch or ſuch Fruits than they have their Seeds in themſelves, which are abſolutely neceſſary to conſtitute them ſuch; for the Seeds in themſelves

ſelves are in the very Conſtitution of every Fruit or Vegetable, and there can be neither Fruit, Vegetable, *&c.* but what are blaſted and dead to all Purpoſes, whoſe Seeds do not naturally ſubſiſt therein as the Fruits or Vegetables ſubſiſt themſelves.

Secondly, We find all manner of Grains, Vegetables, Herbs, and Fruit-Trees ſtill as capable as ever of producing their Species, in ſuch Plenty as the Soil they are planted in is likely to afford, and that the Encreaſe thereof is more or leſs according to the Soil; and that the Seeds, ſown in a better Soil than that from whence the Originals had received their Products, will naturally exceed their Predeceſſors in their future Productions; from whence it muſt appear that they are not limited or confined to any Law for the Diminution of their Productions from the firſt Creation of them.

Thirdly, Notwithſtanding the prodigious Multitudes, that are daily conſumed by Eating and Drinking amongſt the living Creatures of the Globe, yet the Multiplication and Encreaſe producible from the Seeds or Fruits, preſerv'd for Encreaſe, prove ever ſufficient for the Support of the Inhabitants of the Earth, beſides the Quantities employ'd for the Continuation of their Species, which admirably anſwer all the Purpoſes of their firſt Creations and Productions.

Fourthly, This Seed that is in itſelf naturally commences with the Generation of each Fruit, Plant, *&c.* and the Fruit or Plant muſt ceaſe to

be

be a Fruit or Plant, if it has not its Seed in it ſelf: ſo that, if the Fruit be blaſted in the Bud, tho' the Bud had the Seed in Miniature, yet if the Fruit be blaſted, the Seed is alſo deſtroyed, and no future Productions can from thence be procured; but the Seed in that Fruit, which comes to Maturity will never fail of producing its own Species, where it meets with no accidental Impediment, or Blaſt in the Bud to prevent its coming to Maturity. So that,

Fifthly, If the Fruit or Seed be deſtroyed in its Embrio, it is thereby cut off from all generative Faculties, and can never receive the Figure or Form of the Species to which it belonged; for the Want of that Perfection, which Maturity would have given it, has quite render'd it incapable of further Productions; it muſt therefore remain uſeleſs to all further Purpoſes of that Nature; but whatever Fruits or Seeds come to Maturity, they have the ſame Powers and Faculties to produce their Species, as the Fruits or Seeds had, that produced them, and may either produce more or leſs than their Predeceſſors, according to the Advantages or Diſadvantages they meet with of an advantageous or a diſadvantageous Soil and Situation, or the like, agreeable to their different Natures: So that theſe Seeds being in themſelves ſhew that the very Production of the Species is the Production of the Seed of the Species; ſince the Seed will for ever remain incorporate with every Vegetable, *&c.* of its own Kind; it being ren-

der'd

der'd impoſſible, in the Order of Nature, to be otherwiſe.

It will appear therefore, an ungrounded Hypotheſis to maintain, as ſome have done, that every Fruit or Seed ſhould contain in itſelf all thoſe Trees and Fruits in Miniature, that were poſſible to be produced hereafter from them.

It is abundantly ſufficient, I think, that all ſuch Fruit, or Seed, as come to Maturity, are productive of their own Species, and that when ſuch Species ſhall be produced, it is from the Seed in itſelf that conſtitutes it ſuch a Species, ſince without its Seed in itſelf it is not the Species it was firſt created, and therefore the Seed remaining in the Species is that, which thro' all Generations maintains their different Kinds, and will one with another be for ever continued.

For no longer could any Fruits or Vegetables, whatſoever, be ſuch Fruits or Vegetables, than their Seeds in themſelves continue them ſuch; for whatever is blaſted in its Minority is quite deſtroyed, as to its generative Faculty, and quite cut off from the Species; ſo that, that Seed, which is in itſelf, is as abſolutely neceſſary to conſtitute its own Species, as the Soul of Man added to the curious Compoſure of an human Body is requiſite to conſtitute a *Man*, who is no longer a Man than his Soul abides in him.

§. 5. And it is juſt as groundleſs and wild a Notion, to imagine, that the Souls of all Men were created at one and the ſame Time, and afterwards

terwards infuſed into Bodies, as they have been prepared in the Womb to entertain them:* Or that all *Adam*'s Poſterity were in Miniature in *Adam*'s Seminal Productions.

But to the laſt of theſe I ſhall obſerve, that had this been the Caſe, then none of *Adam*'s Seminal Productions could have been loſt, but he muſt have transferred his All to his firſt Succeſſors, and thoſe Succeſſors to the next, &c. and ſo only a Series of Generations of Male and Female at one Birth, would have been continued from one Generation to another, inſtead of that Encreaſe and Multiplication that repleniſhed the Earth by a Continuation of that Seminal Property which ſubſiſted in the Male and Female, and was communicated to their Progeny.

For had all the Seminal Productions of Vegetables, Animals, and Men been in Miniature in them to all their Series of Succeſſions, that Miniature muſt of Neceſſity have been exhauſted in one Production of their different Kinds, ſince that whole Miniature muſt have been contain'd in one Seminal Effuſion and Production; and could only have been committed to their immediate Succeſſor, unto whom would have been transferred the whole Seminal Properties of their Predeceſſors, in Vegetables, Animals, or Men: So that in the human Race one continued Succeſſion only of Male and Female at a

* Of this ſee my *Journey thro' the World*, Sect. 1.

Birth,

Birth, could proceed from one Male and Female: If the whole human Race, therefore, had been confined to our firſt Parents Seminal Productions, in ſuch a Manner, as that in their Seed all their Succeſſors had been in Miniature; the Reſult of this Hypotheſis would have confined the Succeſſion of Mankind to thoſe Bounds abovemention'd; ſince if one Man and Woman had contain'd the whole human Species in Miniature, then muſt they have committed that wholly to their firſt Offspring, as being the only Offspring that was capable of proceeding from them; but as Vegetables, Animals, and Men are continued capable of Seminal Productions, in Proportion to their ſeveral Advantages, and their Seeds in themſelves continued, as long as the Author of Nature has directed their Boundaries, it muſt ſhew, that a Continuation of the Seminal Property is naturally inherent in every Kind, ſo long as its Kind is diſtinguiſhed in its proper Function; and as in Herbs, Fruits, Vegetables, *&c.* the Seeds of each are in themſelves; ſo are the Seeds of Men and other Animals alike in themſelves, and therefore, upon this Occaſion, I have choſen to treat of them here together; ſince the Continuation of the Species of each have a like Dependance, *viz.* Upon the Continuation of the Seeds in each Species, as naturally inherenr in the Species, as the Species itſelf continues to be what it is.

COROLLARY.

And now, upon Reflection into theſe ſurpriſing Works, who can remain inſenſible, and not be ſtruck with Admiration, when, tho' but obſcurely, they have a Glimpſe of the infinite Power and unfathomable Wiſdom of the Author of Nature? It is beyond the Reach of all finite Capacities fully to conceive or expreſs that conſummate Power and Wiſdom that was exerciſed in the Creation, Formation, and Adjuſtment of his harmonious Works. The Myſteries thereof are enough to exerciſe the Wonder and Admiration of all the intelligent Creatures in the whole Univerſe to all Eternity; and to excite their elevated Adorations, and chearful Praiſes, their earneſt Longings, and ſtrongeſt Endeavours after that Purity and Holineſs, that may qualify them for the Enjoyment of this ſupreme and infinitely perfect Being, in whoſe Perfections alone true Satisfaction can be attain'd.

O then, let our Wonder put us upon the Wings of humble Duty, and chearful Obedience to the Laws and Precepts of the revealed Will of our Great Creator, which are calculated both for our preſent and future Advantages; for our preſent and future Welfare have a manifeſt Connection with each other; ſo that, if our virtuous Actions gain us here a preſent Satisfaction of Mind, that is the trueſt Happineſs we can here or elſewhere enjoy; for we can only

only derive from that infinite Fountain of Goodneſs, thoſe Degrees of Satisfaction and Happineſs, that our Proficiencies in ſuch Qualifications ſhall render us capable of receiving: Nothing but the Communications of the Attributes of God's Perfections can render us completely happy in himſelf, for nothing leſs than the Enjoyment of himſelf can afford his intelligent Creatures full and adequate Satisfaction.

VERSE XI.

And the Earth brought forth Graſs, and Herb-yielding Seed after his Kind, and the Tree yielding Fruit, whoſe Seed was in itſelf after his Kind: And God ſaw that it was good.

§. 6. Here is the Command of God anſwer'd, in the unintelligent Parts of the Creation, wherein that Almighty Power is manifeſt, in which is an ample Scene of the Great Creator's admirable Contrivance and wonderful Art: And if we look into the vaſt Variety of Herbs, Vegetables, Fruit-trees, *&c.* with their various Uſes, and obſerve that there is not wanting any Kind, that may ſuit the Occaſions, and add to the Pleaſure, as well as anſwer the Uſefulneſs and Neceſſities of the whole Animal Creation of all Degrees of Intelligence: Does not this afford us an unqueſtionable Aſſurance that theſe muſt be the Works and Contrivance of a Being of infinite Wiſdom, and incomprehenſible Power?

To which we may add his Providential Care and Goodneſs, not only in the Productions of ſuch vaſt Varieties of Herbs, Trees, Plants, and Vegetables, but alſo in creating their Seeds in themſelves, whereby he has provided for all Ages, and for all the Uſes and Occaſions of them; as for rendering them fit for Buildings, Tools, and Varieties of Utenſils, and Veſſels; for Pleaſure, Food, and Phyſick: And the very meaneſt Shrubs and Buſhes, many of which not only produce valuable Fruits, but have alſo their particular Uſes, in becoming Fences to guard the Right and Property of one Neighbour from another.

We may plainly diſcern likewiſe, how the Great Author of Nature has manifeſted his Wiſdom, not only in that Proviſion which he has made to continue and encreaſe each Species, but alſo in that admirable Method in which he provides for the Growth, Nouriſhment, and Continuation of the Fruitfulneſs of each Tree, Plant, and Vegetable, by the Conveyance of the Sap and Juices thro' all the Veins and Pores of both Root and Branch of each of them, which is as neceſſary for their Preſervation and Fruitfulneſs, as the Circulation of the Blood is to animal Life. Alſo the Barks of Trees, and the outſides of Vegetables, are as convenient Coverings to them, as the Coats and Skins of Animals to guard and ſecure them againſt Winter, when their Sap and Juices are ſent back into the Roots, by which their Lives are preſerved in the Earth,

Earth, till the kindly Warmth of the Spring may recall them to exert their proper Fruitfulneſs in the ſeveral Kinds of their Productions for the Pleaſure and Profit of the Animal Creation: Pleaſures from the odoriferous Scents, Gaieties, and Beauties of Flowers and Bloſſoms of Fruit-Trees, *&c.* and Profits from the exceeding Encreaſe of Fruits and Grains, adapted to every Uſe in the Support of Animal Life: For tho' ſo great Quantities of ſuch Fruits or Grains that are the moſt uſeful to ſupport Animals are daily expended upon them, yet their exceeding Encreaſe, thro' their vaſt Fruitfulneſs, not only anſwers that Purpoſe, but the other alſo, of the Continuation of their Species by their Seeds in themſelves, which during all Generations will ſupply all the ſaid Purpoſes; for in all Fruits or Vegetables that come to Maturity their Seeds are ſecured and locked up; and tho' in ſome ſo ſmall that it is ſcarce viſible to the naked Eye, yet all the Lineaments of the Fruit-tree or Vegetable are contain'd in the Lineaments of its proper Seed, and ſo on in every Fruit or Seed produced by it.

§. 7. We may likewiſe obſerve the admirable Proviſion which the wiſe Creator has made for the Continuation of ſuch Vegetables, as thoſe, whereof the Huſbandman and Gardener think their Labour loſt to cultivate and continue their Species, tho' thoſe alſo have their particular Uſes, and are therefore taken particular Care of

by their wiſe Creator, as well in their Generations as in their firſt Productions, as Dr. *Derham* in his *Phiſico-Theology* very well obſerves, where ſpeaking of the Seeds of ſuch Vegetables, he ſays; "Some, being for this End winged with "light Down are conveyed about with the "Winds, others being laid in elaſtic ſpringy "Caſes, when they burſt and crack, dart their "Seeds at convenient Diſtances, performing "thereby the Part of a good Huſbandman; "others, by their agreeable Taſte and Smell, "and ſalutary Natures, inviting themſelves to "be ſwallowed, and carried about by the Birds, "and thereby alſo fertilized by paſſing thro' "their Bodies;" while thoſe, not thus taken Care of, do invite the Huſbandman and Gardener by the Profits ariſing from them, carefully to ſow and nurſe them up.

§. 8. We may likewiſe obſerve that Proportion which there is between the Roots and Branches of Trees, the Roots of which are always adapted to the Bulks of the Bodies and their Branches, and ſo fixed in the Earth, as to ſupport them againſt all common Accidents, in ſuch as ſtand by their own Strength; and theſe are alſo capable to bear up ſuch feeble Vegetables, as naturally depend upon their Bodies for Support.

§. 8. It is alſo an admirable Proviſion that the Wiſe Creator has made, to render the moſt

uſeful

useful and serviceable Grains the most fruitful; such in particular as serve for Bread and Drink, which are easy to be propagated almost in every Soil and Climate: It is also observable, that different Countries have their different Products in Fruits, Grains, and Vegetables, and are proportion'd to the common Occasions and Necessities of the Inhabitants of them, as their different Situations make requisite for them.

" 'Tis, for Instance, says Dr. *Derham* in the aforesaid Book, p. 433. " an admirable Provi-" sion made for some Countries, subject to " Drought, that, where the Waters every where " fail, there are Vegetables, which contain not " only Moisture enough to supply their own " Vegetation and Wants, but afford Drink also " both to Man and other Creatures, in their " greatest Extremities."

Thus he, in a Marginal Note taken from *Navarette*, " tells us of a Tree called *Bejuco*, " which twines about other Trees, with its End " hanging downwards, and that Travellers cut " off the Nib of it, and presently a Spout of " Water runs out from it as clear as Crystal, " enough and to spare for Six or Eight Men." And then tells us, " It is a Juice and natural " Water, and is the common Relief of the " Herdsmen on the Mountains, who, when " they are thirsty, lay hold on the *Bejuco* and " drink their Fill." So in *Jamaica*, he tells us from Dr. *Sloane*, of a Vine called the *Waterwith*, " which grows on dry Hills in the Woods, " where

" where no Water is to be found, its Trunk, if
" cut into Pieces, two or three Yards long, and
" held by either End to the Mouth, affords ſo
" plentiful a limpid, innocent and refreſhing
" Water, or Sap, as gives new Life to the
" droughty Traveller or Hunter, whence this
" is very much celebrated by all the Inhabitants
" of theſe Iſlands, as an immediate Gift of Pro-
" vidence to their diſtreſſed Condition.

" And a great deal more, ſays he, might be
" inſtanced in of a like Nature, and Things
" that bear ſuch plain Impreſſes of the Divine
" Wiſdom and Care, that they manifeſt the
" Superintendance of the infinite Creator.

§. 10. Thus from this ſmall Sketch of the admirable Proviſion made by the Author of Nature in furniſhing this Globe for the Pleaſure and Support of its Inhabitants before his creating and placing any upon it, it muſt neceſſarily ſet forth the Wiſdom, Power, and Goodneſs of the Creator and Contriver of theſe wonderful Works, thus admirably adjuſted to the various Neceſſities and Occaſions of the whole future animal Creation, and throughout all their ſucceeding Generations; for without the animal Creation all the inanimate Bodies, and their unintelligent Furniture muſt for ever have remained uſeleſs; and therefore it was only from the Services and Uſefulneſs, which God ſaw they would be of to the future animal Creation, that he pronounced them Good: And upon this Account their

Creator

Creator might well pronounce them Good, ſince in Plenty, Beauty, and Variety, they were fitted for all the neceſſary Occaſions that could ariſe from the Wants of this whole animal World.

COROLLARY.

If in our degenerate State, ſince the whole Creation has been made ſubject to Vanity thro' Man's Diſobedience, ſuch Footſteps of the Wiſdom and Goodneſs of God are ſo conſpicuous, even thro' all Ages and Countries; what then would appear in a Paradiſaical State? But as a View thereof is ſo far loſt to us in its primitive Perfection, that we can have only an obſcure Idea of it, let us content ourſelves with the Proſpect before us of that promiſed and much preferable Happineſs to be obtain'd by us, by our patient Continuance in Obedience to that Second Covenant which God has vouchſafed to make with us thro' his Son Jeſus Chriſt, to whom with the Father, and Holy Spirit, be aſcribed the Kingdom, Power and Glory for ever and ever. *Amen.*

VERSE XIII.

And the Evening and the Morning were the Third Day.

Of this ſee my Obſervations of the Evening and Morning of the Firſt Day's Work, which will ſerve for the Concluſion of every Day's Work.

CHAP.

CHAP. VII.

VERSES 14, 15, 16, 17, 18, 19.

AND God ſaid, Let there be Lights in the Firmament of Heaven, to divide the Day from the Night: And let them be for Signs and for Seaſons, and for Days and Years.

And let them be for Lights in the Firmament of Heaven, to give Light upon the Earth: And it was ſo.

And God made two Great Lights, the Greater Light to rule the Day, and the Leſſer Light to rule the Night: He made the Stars alſo.

And God ſet them in the Firmament of Heaven, to give Light upon the Earth.

And to rule over the Day and over the Night, and to divide the Light from the Darkneſs: And God ſaw that it was Good.

And the Evening and the Morning were the Fourth Day.

§. 1. Now the Atmoſphere of the Air became ſufficiently cleared from theſe heterogeneous Particles of Earth and Waters that had before obſtructed the Sight of the Sun's Body at the Surface of the Earth, and conſequently the other Luminaries, the Moon, Planets, and Fixed Stars, which now alſo became viſible, from

from their Atmoſpheres becoming cleared (allowing them, as before proved reaſonable, that their Formations were cotemporary) and thereby made capable of receiving, collecting, and refracting the Rays and Light of the Sun as well as this Earth, and to return it hither by Reflection, upon which both Sun and Moon, and alſo the Planets and Fixed Stars upon the Night's Approach, became viſible to ocular Perception at the Surface of the Earth; and as Things are repreſented to us in the Scriptures generally according to common Appearances, they are then ſaid to be made; that is, they then became clearly apparent thro' the Atmoſphere to the Surface, as an abſolute neceſſary Proviſion made for the Reception of the Earth's future intended Inhabitants, without which Proviſion, as before obſerved, all other Furniture would have been render'd uſeleſs, and could in no manner have become ſerviceable; for the Fruits of the Earth could never either have come to Maturity, or have continued their Production,, or encreaſed their Kinds, nor the animal Life have been propagated or a Succeſſion thereof brought forth without the enlivening Rays of the Sun.

And therefore as it was firſt of all neceſſary, that ſuch Proviſion ſhould be made that would ſuit all the Occaſions of the future animal Creation, ſo we find that infinite Wiſdom and Power takes Care, that no Want either of neceſſary Convenience or ornamental Luſtre, ſhould be found by the Inhabitants that were to inherit it.

§. 2. And

§. 2. And as Time was to be the Meaſurer of all their Occurrences, ſo Days, Nights, and Years (whether they were ſynonimous at firſt or not, as hinted before, it was the ſame as to this, for, I ſay, Days, Nights, and Years) were to be the Meaſurers of Time; and theſe Lights appointed for Days and Nights, were appointed for Signs and for Seaſons, and for Days and for Years.*

But thro' the annual Revolution of the Earth, ſuppoſing it at firſt to have no other Motion, the Sun would then rule the Day and the Moon the Night, and the reſt of the Planets, with the Fixed Stars, would then riſe in the Weſt and ſet in the Eaſt, and the Fixed Stars, that firſt appeared in the Weſt, after Sun-ſetting, would, from thence, by the Earth's annual Revolution ariſe to the Meridian, and after recede to the

* Not for Signs from whence to predict all human Affairs and Occurrences, as has been by ſome vainly imagined and contended for; for this Knowledge was never deſigned or intended for Man, nor would it have been his Intereſt to have been acquainted therewith, for his Foreknowledge of common Accidents would have been to his Diſadvantage: As for Inſtance, could every Man be acquainted with the Day of his Death, or any of his Misfortunes beforehand, the one might hinder his Induſtry in his proper Way of Life; and the other bring upon him thoſe Anxieties, that he might feel them more in Expectation than in the very ſuffering of them when they fall, and diſtreſs him much more than the Ignorance of them can do.

Eaſtern

Eaſtern Horizon, which when they approached muſt be a certain Sign of their Seaſon to diſappear, and of the Return of the illuſtrious Preſence of the Sun. And likewiſe the Moon, which ruled the Night, would certify and confirm the ſame, and by every Poſition of her Full, in her Six Menſtrual Revolutions in the Night, ſhew how far the Sun was receded from the Eaſtern to the Weſtern Horizon; and be thereby a certain Sign of the Time and Seaſon of the Night, ſo that the Seaſons thereof would from theſe Signs be truly calculated and underſtood.*

But if we conſider it now, both with its annual Revolution and diurnal Rotation, we ſhall find as much Uſefulneſs ſtill as to the Signs and Seaſons ariſing therefrom; for hereby are the Revolutions of Days and Nights, Months and

* For in this Caſe it is plain to common Experience, that if the Earth had only then an annual Motion, that the Sun, Moon, Planets, and Fixed Stars would riſe in the Weſt and ſet in the Eaſt: *Firſt*, from the Fixed Stars, &c. now, by the Earth's diurnal Rotation from Weſt to Eaſt, riſing in the Eaſt, and from their riſing every Night near four Minutes ſooner than the former, from the Earth's continued annual Revolution, and thereby making the Sydereal Days to the Year one Day more than the Solar; ſo that from one Revolution of the Earth round the Sun it gives a View of the Fixed Stars in every Hemiſphere once more than it had gain'd Times of the Sun's Preſence therein by its diurnal Rotation. *Secondly*, The ſame appears from the Menſtrual Motion of the Moon, which, after paſſing by the Sun at her Changes, always makes her firſt Appearances in the Weſtern Horizon.

Years;

Years; with Spring, Summer, Autumn and Winter; we have likewiſe a View, in every Latitude, of one Hemiſphere of the Fixed Stars, and their Seaſons of Appearances adjuſted, as to their Riſings, Southings, and Settings, from which the Hours of the Night thro' the Seaſons of the Year may be truly known, and Latitude both at Sea and Land truly aſcertained: Thus they are of exceeding Uſefulneſs to us in theſe and many other Reſpects, when the Abſence of the Sun admits their Viſibilities; while its Preſence, enjoyed by the other Parts of the Globe, delivers thoſe Inhabitants from the Want (and therefore from the View) of the Stars: So that, as the Sun rules the Day, and the Moon and Stars the Night, they are both in their Turns and Seaſons rendered as exceedingly uſeful and neceſſary as the Conveniencies of this Globe's Inhabitants, and no doubt of all the others belonging to this Solar Syſtem, could poſſibly enjoy, being adjuſted to anſwer all thoſe Occaſions that could ariſe from the Wants of all the rational and ſenſitive Inhabitants that were afterwards deſign'd to be placed upon them.

§. 3. For when the Light of the glorious Luminary, the Sun, is withdrawn from one Hemiſphere to another, the Planets of our Solar Syſtem, when they are, by their Motions or Revolutions above the Horizon during the Sun's Abſence, become viſible, by receiving, collecting and refracting the Sun's Rays in their Atmoſpheres,

ſpheres, and reflecting them into ours: Likewiſe the Fixed Stars, which ſhine by their own native Lights, for it is impoſſible at their immenſe Diſtances, of which hereafter, they could receive and return to us any viſible Light from the Sun; I ſay, theſe were alſo ſo far made Lights to us as was neceſſary, and therefore ſaid to be Lights in the Firmament of Heaven, or to make their Appearances thro' our Atmoſphere to the Surface, and thereby, to give Light upon the Earth, in the Abſence of the Sun; tho' they were placed by infinite Wiſdom at ſuch immenſe Diſtances, that they ſhould not diſturb any of the Planets of this Solar Syſtem in their Motions and Revolutions by the Powers of their Attractions.

So that, our Sun, as it is the Center, ſo it may be juſtly ſtiled the Soul of the whole Syſtem, both of the primary and ſecondary Planets belonging to it, to whom it communicates ſufficient Light and Heat, and conſequently Life, and Vigour to the whole animal and vegetable Creations of this, and all other Globes, that have their Revolutions round it, whether primary or ſecondary Planets.

§ 4. But as the Fixed Stars apparently ſhine by their own native Light, and are at ſuch immenſe Diſtances from us, they are therefore, I think, with very good Reaſon, ſuppoſed to be of the very ſame Nature, and to be equal in their Bulks to the Sun itſelf, and to have the

same Uses of affording Light and Heat, &c. to distant opake Planets, or Globes, to us invisible, notwithstanding all the optick Helps which we are able to procure; and these may have their Periods and Revolutions round them, in and after the same Manner as this Globe the Earth, and the rest of the Planets of this System do about this Sun; for as it is made plain, that their Lights are certainly native, or proceed from themselves; and that their Distances are so immense, it must be most reasonable to imagine, that their Uses are proportion'd, by infinite Wisdom, as their Bulks and Powers have render'd them capable of being serviceable.

But as at present we can only very probably guess at these Uses, let us now consider the Usefulness of them to us; and here we find, that the Immenseness of their Distances is, even, much more calculated for our Benefit, than if they had been placed nearer: For had they been so placed as to have afforded Heat, as well as Light, both their Heats, and greater Lights would have become incommodious; their Lights would have become inconvenient for the Night's Retirement and Refreshment; and their Heats would have been destructive of both the vegetative and animal Life, by obstructing those natural Gradations that are requisite to bring them to Maturity; since their Juices and Blood, would be thereby bound up, and Circulation stopped in both, by Drought and Heat.

But

But by the Position and Distance they are placed in, they become exceedingly useful to us; for in their Seasons, by their Risings, Southings and Settings, they become Signs of the Times and Seasons of the Year, as well as discover to us the Hour of the Night; from them also the Mariner discovers his Latitude at Sea; and fully to set forth all their Uses and Services to us, is a Task too difficult for me, or, I think, any one to undertake; I shall therefore only here observe, that they become such Lights to us, as to preserve our Nights, in the Absence of both Sun and Moon from entire Darknesses; when we can then also view them, even, at their immense Distances with Admiration, and be convinced that they are Works of no less than an Almighty Power, and from thence may raise our Thoughts and Contemplations to soar above this little Habitation (tho' of itself an admirable Structure) that our Aspirations may not be confin'd to that only, while there are so many so much greater and more wonderful heavenly Glories, even, in our View to exercise our higher Contemplations.

And now having taken a short and general View of the Usefulness of the Sun, Moon, Planets, and Fixed Stars, as placed in the Firmament to give Light upon the Earth; and shew'd wherein they rule the Day and Night, and how they are appointed for Signs and for Seasons, and for Days and Years; I shall now proceed to examine what is more particularly observable

from each of the Planets or Globes of our Syſtem: In which I ſhall, according to the Accounts of our modern Authors, conſider their Magnitudes, Diſtances, Motions, *&c.* with their Uſefulneſs to one another ariſing therefrom, both amongſt the Primaries, and their ſecondary Attendants; and of each in their Order.

Now the *Sun*, I have before obſerved to be the Center and Soul of the whole Syſtem of the Planets, whether primary or ſecondary, all which reſpect it as their Center, and from it receive their Light and Heat, and have their Beauties ſhewn, and their Neceſſities of all Kinds ſupply'd both in animal Life and vegetable Productions: And as ſuch a Proviſion was abſolutely neceſſary amidſt the Globes of the Material Creation, ſo, as before noted, it was firſt of all taken Care of as the moſt uſeful and neceſſary Ornament, and Enlivener of the whole Fabricks of this Planetary Syſtem, as well as of this Globe we inhabit. I ſhall therefore here give it the firſt Place in the ſubſequent Obſervations.

CHAP. VIII.

Of the SUN.

§ 1. NOW the infinite Power and Wiſdom of our GREAT CREATOR is admirably conſpicuous, and worthy of our ſerious Contemplation, in ſo properly fixing the Poſi-

tion,

tion, framing the Bulk, and adjuſting the Diſtance of the *Sun*, and enduing it with the Powers of Light and Heat: Its Diſtance is ſo wiſely adjuſted to the Denſity and elementary Qualities of this Globe, the Earth, and its Atmoſphere, that we find the Proportions moſt juſtly uſeful and commodious to us, and which, no Doubt, is ſome Way or other made as uſeful and commodious to all the Planets, that receive their Light and Heat from it, in adjuſting their ſeveral Atmoſpheres to the Diſtances of their Bodies from it; ſo that the Sun may communicate to *Saturn*, the moſt diſtant, as much Light and Heat as to *Mercury*, the neareſt to his luminous fiery Rays; for the Bodies of thoſe that are neareſt may have the greateſt Denſity, and their Atmoſpheres the moſt *thick*, to guard and ſecure them from any baneful Influences that would ariſe from too much Light and Heat to annoy the Inhabitants, or deſtroy, inſtead of nouriſhing, their vegetable Productions; ſo that the Bodies and Atmoſpheres of all the Planets, it is highly reaſonable to believe, have their Denſities proportion'd to their Diſtances from the Sun.

Hence muſt ariſe alſo the Neceſſity of its prodigious Bulk, for its executive Powers, to render it capable of affording all the primary and ſecondary Planets of its Syſtem both ſuch Light and Heat as are requiſite and neceſſary for them, whether placed nearer to or more diſtant from it; and which, as before noted, 'tis moſt reaſonable

to imagine, was from that admirable Proviſion in proportioning the Denſities of the Bodies and Atmoſpheres of them *all* to be agreeable to their Diſtances; and that this is the Caſe, I rather chuſe to ſuppoſe, than to imagine, as ſome have done, that the Vegetables and Inhabitants of other Globes have had their Conſtitutions proportion'd to their greater or leſſer Diſtance from the Sun, ſuppoſing its Heat only proportion'd to its Diſtance; and tho' even this would diſplay great Wiſdom in the Contrivance, yet I ſhall endeavour to ſhew, that the other Hypotheſis carries in it more Marks of Wiſdom, for Reaſon to comply with.

And that it is moſt reaſonable to ſuppoſe, that the Denſities of all the Planets, whether primary or ſecondary, are proportion'd to their Diſtances, and that *Mercury* may not receive above the common Light and Heat that we do, nor *Saturn* leſs, I think, may be moſt agreably imagin'd from the following Reaſons.

Firſt, We find, that all Animals and Vegetables upon our own Globe, as well as the Globe itſelf, conſiſt of the four Elements, and their Well-being and Subſiſtence depend upon a due Temperature of theſe Elements, and that where theſe have the neareſt Analogy the beſt Conſtitutions of each are enjoy'd; or where this is moſt wanted the Conſtitutions are thereby accordingly impair'd or deſtroy'd.

Secondly, If the Heat of the Sun, or Light thereof, which I ſuppoſe to go together in due Propor-

Proportion, should be suffered upon any Globe to overbalance that requisite Temperature of the Elements of Earth, Air and Water; or to overpower the Organs of Vision, then the Elements being thus quite overborn, would be suppressed and lose those necessary Influences, wherewith they refresh and support the Vegetable and Animal Creation, and with which they can only be endued thro' a due Density proportion'd to their Distances.

Thirdly, We are very sensible, that this Globe to which we belong, has such Differences of Heat and Cold as arise from its different Climates and Situations of Parts one from another, in lengthening and shortening of Days and Nights, and tho' an equal Distribution of the Light of the Sun, as I have before observed, is nearly dispersed, take the Year throughout thro all the Parts of the terraqueous Globe, yet there are some Parts of it which remain uninhabitable thro' Extremity of Cold, and some rendered incommodious thro' Excess of Heat; notwithstanding all the habitable Parts of it are provided for in a very surprising Manner, by the Constitutions of the Inhabitants of each habitable Part thereof being inured thereto, and suited to their Necessities, as far as it is possible for them to consist with Nature, to be forced from that due Temperament arising from an agreable Consistency of the four Elements: For tho' the Constitutions of various Animals, and even, Animals of the same Kinds, may be various, and

of Vegetables too, yet none can exiſt well with too great an Exceſs either of Cold or Heat; or when either of them overbalance a due Proportion of the Compoſition of theſe Elements, upon which Life, whether Animal or Vegetable, entirely depends; tho', as above, ſome, both Animals and Vegetables, require more of the one than the other, yet neither can ſubſiſt in too great an Exceſs or Diſproportion of them; ſo that the Differences ariſing from different Climates upon one Globe, I think, is ſufficient, for the foregoing Reaſons, to make it moſt reaſonable to ſuppoſe, that the Denſities of all the planetary Globes are proportion'd to their Diſtances, and admit of the Rays of Light and Heat according to the different Places of the Situations upon thoſe Globes, with much the ſame Influence as we do, ſince they appear to be compoſed of the ſame Elements as our Earth, and in all Probability have the ſame Occaſions for the ſame Degrees of Light and Heat for much the ſame Purpoſes.

Fourthly, The Difference of Climates upon our own Globe, tho' ſome Parts, as above obſerv'd, are thereby rendered uninhabitable, yet this makes but a ſmall Alteration of the Differences of Cold and Heat upon this Globe itſelf, to what would enſue from the different Diſtances of the ſeveral Globes of this Syſtem, were they all made alike of the ſame Denſities in their Bodies and Atmoſpheres, and received Light and Heat alike merely from their Diſtances;

ſtances; for Example, If this Globe which we inhabit, was placed as near the Sun as *Mercury*, with its Body and Atmoſphere of the ſame Denſity as it is now, it would preſently be burnt up, and not fit for either Vegetable Productions or Animal Inhabitants. Again, was it placed as far diſtant as *Saturn*, in the ſame Circumſtances, its Atmoſphere would be incapable of receiving or collecting any ſufficient Rays of Light or Heat to produce ſuch Effects as Animal Life requires, and all Vegetables have their Productions from; ſince the Exiſtence and Subſiſtence both of animal and vegetative Life, as before obſerved, depend upon a near Temperament of the four Elements; and utter Extremes of the Predominance of any one of them cannot conſiſt with the Exiſtence of either Animals or Vegetables. But was this Earth's Denſity in Body and Atmoſphere, at either of theſe Diſtances, proportion'd thereto, I doubt not, but it would thereby be as proper a Receptacle for Inhabitants, and as fit for Vegetables as it now is: And for theſe Reaſons I conclude, that the Divine Wiſdom, which clearly ſhines in all his Works, has thus adjuſted the Denſities of all the Planets, whether Primary or Secondary, according to their Diſtances, rather than to ſuppoſe, that he has otherwiſe made ſuch Proviſions for them all, as to anſwer the ſame Purpoſe: An Inſtance of which may be obſerved in *Saturn*'s admirable Ring, of which, when I come to treat of that Planet by itſelf, I

ſhall

ſhall ſpeak more at large: And accordingly we may believe the ſame Wiſdom is obſerved thro' all the Syſtems of the Planetary Bodies accompanying the Fixed Stars, which we now look upon as Suns to other Globes.

For tho' it has been formerly imagined, that this Earth, or Globe which we inhabit, was the Center of the Univerſal Material Creation, and that all apparent Motions of the Sun, Moon, Planets and Fixed Stars were real, and made all the ſeeming Revolutions, that were obſerved by our common Viſion, yet, now, as the learned Part of Mankind are convinced, that the Sun is the Center of this Syſtem, &c. I ſhall think it needleſs, except where it ſhall hereafter fall in my Way almoſt unavoidably, to repeat the Arguments that have been made uſe of, which have, as I ſaid, ſatisfactorily proved it to the Learned; and ſhall take it for granted, that the Sun is our Center, and, as before obſerved, the very Soul of both the animate and inanimate Parts of the whole Syſtem belonging to it, and therefore of the greateſt Uſefulneſs, as well as the moſt beautiful Ornament of the whole inanimate Creation, and what nothing leſs than infinite Wiſdom was capable of contriving, or producing, and which will further appear from a Conſideration

Of his Magnitude and Diſtance.

§. 2. The Magnitude of the Sun is computed from

oon its Diſtance, and viſible Appearance, and s Diſtance from its Horizontal Parallax, and the eſt and moſt accurate Obſervations, that have een made to diſcover his Parallax, Dr. *Derham* dges to have been by that great Aſtronomer ſonſ. *Caſſini*, who aſſign'd a Middle between Mr. *Flamſted* and Mr. *Huygens*, and ſuppoſes is Parallax to be 9½ Seconds, and from thence omputes his Diſtance 21600 Semidiameters of he Earth, or 86051398 *Engliſh* Miles, ſo that s Solid Content appears from thence to be 90,971,000,000,000,000 of Miles; and where s he makes the Solid Content of the Earth to e but 265,000,000,000 of Miles, the Solid Content of the Sun's Magnitude is more than hat of the Earth 1,098,003 Times; and muſt conſequently be vaſtly ſuperior in Bulk to all he Primary and Secondary Planets put together of its whole Syſtem, and conſidering the abſolute Neceſſity of its Uſefulneſs to them all, it is very reaſonable to expect it ſhould have its Magnitude thereto proportion'd, to adapt it to thoſe two great and moſt uſeful Offices of affording both Light and Heat in a ſpirituous Manner to all the Globes which reſpect it as their Center, and have thoſe Benefits flowing from it.

Its much ſuperior Bulk to all the Globes it warms and enlightens appears alſo neceſſary to perform theſe Offices at ſuch Diſtances, which were neceſſary for them to be placed in from it, and one another, ſo that they might not claſh nor interfere in their Motions amongſt themſelves,

ſelves, and that their periodical Revolution might be performed in regular and due Order throughout all their Mutations and Appearances.

§. 3. Nor will their Diſtances appear a Wonder, if we conſider that the Space that contains them is abſolutely infinite, ſince therefore whatever Diſtances are neceſſary for the well Being of Bodies, or Globes to perform their Laws which the wiſe Creator has aſſign'd them in their various Motions; theſe Diſtances are as more to infinite Space than a mere Point: for let Bodies be placed at what Diſtances ſoever, there will never want Room enough for innumerable Bodies more; ſince if the Globes in the Univerſe, tho' now innumerable, ſhould be daily encreaſed, and be at ever ſo great Diſtances, there would never want ſufficient Space for them to be placed, and ſo encreaſed in, but Space would for ever remain without being interſperſed throughout with Material Globes, as I have proved in my laſt Philoſophical Diſſertation lately publiſhed.

As there is then Room enough for all neceſſary Diſtances of Globes, ſo we find their Diſtances proportion'd by the infinite Wiſdom and Power of the Great Creator, to anſwer all juſt and neceſſary Occaſions; and which will ſtill further appear from the Magnitudes and Diſtances of the Fixed Stars, which being now very reaſonably ſuppoſed to be ſo many Suns, as before noted, may juſtly find a Place of Obſervation in this Chapter.

§. 4.

§. 4. And that they are ſuch Globes, and have Planets revolving about them, I think, appears more than barely probable from their immenſe Diſtances, and their ſhining by their own native Lights; both which plainly appear to us: For their Diſtances are ſo immenſe and immeaſurable, that no horizontal Parallax was ever diſcoverable in any of them, they muſt therefore be beyond the Reach of this Sun's Rays to illuminate them, and be quite incapable of receiving and returning them: But the Light they ſhine with is vivid and ſtrong, whereas any Globes at that Diſtance, where no horizontal Parallax can be diſcover'd cannot poſſibly return a reflected Light: Their Diſtances alſo from one another are never found to vary, as the Planets, that have their Revolutions round the Sun.

For theſe Reaſons, therefore, they are juſtly ſuppoſed to be Suns, and therefore to have the ſame Uſes with this Sun from whence we receive our Light and Heat; and as they are ſuppoſed to be made for the ſame or the like Uſes, we alſo ſuppoſe them to have nearly Magnitudes alike, as from the above Conſiderations we have no Reaſon to ſuppoſe the contrary; and the very largeſt of them, in Appearance to us, have their Diſtances ſo immeaſurable, that no horizontal Parallax thereof could ever be diſcover'd, and as theſe muſt be the neareſt to us, and are thoſe which we diſtinguiſh by Stars of the firſt Magnitude

nitude, even these by our latest Astronomers are computed to be in Appearance less than the Sun 27664 Times; and the Sun's Distance, being computed, as before noted, at above Eight Millions of Miles from the Earth, then the nearest Fixed Stars, or those of the first Magnitude must be 27664 Times eighty Millions of Miles or 2,213,120,000,000, which is so immense a Distance, that according to Mr. *Huygens*, from the Velocity of a Ball flying out of the Mouth of a Cannon, whose Velocity according to the Observations of *Merſennus* is 90 Fathoms in a Second of Time, in which continued Velocity it would take 25 Years in reaching the Sun, and consequently above 700000 in reaching the nearest Fixed Star: Yet, as before noted, their Magnitudes and Distances need not appear ſurpriſing, any other Way, than that they are the Works of incomprehenſible Power and Wiſdom, when we conſider, that Space, that contains them, is abſolutely infinite, and therefore ſufficient to contain more than ever Number can reach, let their Diſtances be ever ſo immenſe, or their Magnitudes ever ſo large.

§. 5. For infinite Space is without all imaginable Bounds; and Diſtances of Globes therein are no more than perfect Points in Compariſon thereto; for if you would think to contain it in a Circle, and ſhould extend the firſt Circle you would contain it in ten thouſand Times ſo far

far beyond the furthermoſt Fixed Stars as it is to them, and ſhould multiply Circles from the firſt at the ſame Diſtances one beyond another, and if it was poſſible to repeat this, in Imagination, every Minute for ten thouſand Times, ten thouſand Millions of Ages, yet the laſt Circle would be as far from including infinite Space as the firſt was, or even as the Center of them itſelf was from it, as I have obſerv'd in my Philoſophical Diſſertations. So that from hence we may learn, that theſe or any other Diſtances which we look upon to be ſo immenſe, are nothing to Infinity, which is impoſſible for finite Beings to comprehend, and that the greateſt Degree we can arrive at towards comprehending it, is, that we can only form ſuch Notions of it as we can thereby diſcover it to be paſt our Comprehenſions.

Now in adjuſting the Diſtances of Globes, we find, as to this Earth from the Sun, that the allwiſe Creator has made an admirable Proviſion for us, in adapting its Denſity to its Diſtance, ſo as to receive that comfortable Communication from its Light and Heat, by which all Vegetable Productions and Animal Lives are propagated and preſerved; and herein appears an admirable Proviſion of the Divine Power and Goodneſs, in ſuiting every Thing to the Occaſions and Neceſſities of the animal Creation, ſo as to be ready for their Enjoyment, as ſoon as they ſhould be made Tenants of this new Fabrick.

Of

Of the SUN's *Motion.*

§. 6. I have before obſerved, that the Sun is placed in the Center of our planetary Syſtem; and tho' it conſtantly keeps therein, yet we can plainly diſcover from certain dark Spots obſervable on it, by the Help of ſmoked Glaſſes, that it revolves upon its own Axis once in 25 Days and 6 Hours; and we need not doubt but that wiſe Ends in the Creation are thereby anſwered.

All the Material Globes of its whole Syſtem, that we can ſo far acquaint ourſelves with, are found to have their periodical Revolutions and diurnal Rotations, which are undoubtedly adapted to the various Occaſions of their reſpective Inhabitants: May we not then ſuppoſe, that the Rotation of their Central Luminary, the very Soul and Center of them, may prove of peculiar Service to them all?

As firſt, may it not be neceſſary to emit thoſe Spirituous Flames amongſt ſo many planetary Orbs, that depend upon it for Light and Heat, thereby to nouriſh and keep alive their Vegetables and Animals? And may it not be from thence that its attractive Powers were received and are preſerved? And may it not likewiſe be the Means to put into, and continue, as an Axis, the Grand Revolution of the whole?

There is alſo an apparent Advantage ariſing therefrom to this Globe's Inhabitants; for from a true Calculation of the Times, when ſome parti-

particular Spot will appear (that may be known to Calculator and Obſervator) on the exact middle of the Sun's Diſk, the Obſervators thereof at a different Meridian, by finding when ſuch Spot, ſo calculated has the ſame Poſition there, and by finding the Hour of the Day with themſelves, how far it is from the Hour when that Spot was calculated to make ſuch Poſition at the Meridian for which it was calculated; they may from thence diſcover and correct the different Longitudes of Places as well as from the Immerſions and Emerſions of the firſt Satellite of *Jupiter*, as I have formerly ſhewn from both, in a Diſcourſe of the Longitude at Sea.

And tho' we cannot aſcertain all the Uſes this Motion of the Sun may be of to this, or, much leſs to all other Globes of his Syſtem, yet this may be enough to convince us that it is juſtly adapted by the infinitely Wiſe Contriver and powerful Author of the whole animate and inanimate Creation; for his Works are Works of Wonder and paſt finding out; tho' our Searches into them are delightful and agreeable Amuſements.

Thus having taken a tranſient View of the exceeding Uſefulneſs of the Sun, that Great Light which became clearly viſible (with the Moon and Stars in the Night enſuing) upon this fourth Days Work of the Creation, I ſhall proceed, in the next Place to conſider that leſſer Light.

CHAP. IX.

Of the MOON.

§. 1. THE Moon is an Opake Body, conſiſting of the ſame four Elements as this Earth; and has Hills, Mountains Rivers, and Seas, diſcovered by all our modern Obſervators; ſhe only becomes luminous to us by receiving and returning the reflected Rays of the Sun, according to her Situations thro' her Menſtrual Revolutions round this Globe, which ſhe reſpects as her proper Center, and accompanies throughout its annual Revolutions; and as ſhe is placed in Poſition to the Sun in her menſtrual Motion, that Part thereof, which reſpects our View ſo far as it receives the Sun's luminous Rays, it collects and reflects them to us in a fainter or leſſer Light; and conſequently, that Part of the Moon thus enlightened, which beholds the Earth only appears to us; ſo that ſoon after her Change by her menſtrual Motion, as ſhe advances from the Sun, and makes her Settings after him every Night later, that Part of her to our View becomes more and more enlightened; but upon the firſt Sight we have of her after the Change, ſhe leaves our Horizon ſo ſoon after the Sun, that moſt of that Part of her Body that the Sun ſhines on is out of our View, and only one Edge of her illuminated

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Part is within it; but as ſhe, by her menſtrual Motion recedes every Night further and further from the Sun, from her Change to her Full, ſhe encreaſes all the while to afford us more and more Light, till at her Full when ſhe is in Oppoſition to the Sun, or on the contrary Side of this Globe to the Sun; her Face, which is then full towards the Sun muſt needs be the ſame towards us, and therefore become our Full Moon, having the whole Hemiſphere towards us illuminated; for altho' one half of her is conſtantly illuminated by the Sun, yet that half thereof thus illuminated can never appear to us but in this Poſition: From which ſhe alſo gradually recedes, and her Illumination as gradually declines from us, from her Full to her Change again, as it encreaſed from her Change to her Full; but as this is ſo plain to every one's Experience, I ſhall no longer dwell upon it, but proceed to obſerve, That

§. 2. Her menſtrual Motion deſcribed about the Earth is in a different Plain to the Earth's Revolution about the Sun, and cuts the Ecliptick in two Points, which are called her *Nodes*, by the Appellations of *Dragon's-Head*, and *Dragon's-Tail*, in cutting the firſt Node, or *Dragon's-Head*, ſhe paſſes from the South to the North Latitude of the Ecliptick, & *è contra*, and when in the croſſing of this Circle, of the Ecliptick, it happens exactly at her Change, ſhe makes a Total or Central

Eclipſe of the Sun to thoſe Places of the Earth where her Change happens in the Day-time, where the Moon's Parallax carries not her Body to the North or South to prevent it; and when it happens ſo at the Full Moon, it cauſes a Total and Central Eclipſe of the Moon to the whole Hemiſphere ſhe is then viſible to; ſo that Eclipſes of either Sun or Moon always happen when the Moon's Latitude, at Change or Full, carries not her Body far enough North or South from the Ecliptick, or North or South of the Body of the Sun at her Change, or North or South of the Shadow of the Earth at her Full: And the Earth's Shadow at the Moon's Diſtance being about three times the Breadth of the Moon's Diameter; and the Body of the Moon, at her Diſtance from us, in, or near her Perigeon, being only capable of totally eclipſing a ſmall Tract of the Earth; it is from hence that total Eclipſes of the Sun ſo very ſeldom happen, and that thoſe of the Moon are ſo frequent.

It is alſo obſervable, that theſe Nodes, or Paſſages of the Moon from South to North, and from North to South Latitude, in cutting the Ecliptick, do always keep a conſtant retrogade Motion thro' the 12 Signs of the Zodiack, which they move thro' once in ſomething leſs than 19 Years; and Eclipſes always happen when the Moon is at Change or Full near the Degree of that Sign in which theſe Nodes have their Places, ſo that they can happen at no Time of the Year when the Moon at Change or Full

Full is much diſtant therefrom, and theſe Times, that the Moon is at Change or Full near theſe Nodes, can only be at two Seaſons of the Year, which Seaſons change with the Motion of the Nodes; and there can ſeldom happen above two Eclipſes of each Luminary in one Year worthy of the leaſt Notice in any Parts of the Globe: When the Moon's Place in the Zodiack indeed happens to be about 15 or 16 Degrees from the Place of the Node upon the firſt Eclipſe (beyond which none can happen) then there may happen three of each, but then, as before obſerved, two only will be worthy of our Notice, and only the middlemoſt of the three firſt and three laſt will be of any Conſequence, and as the middlemoſt of each three will fall in or near the Place of the Node itſelf, that of the Moon will be total to that Hemiſphere to which it is viſible, and that of the Sun large and perhaps total to ſome Latitudes.

Now the Moon, tho' computed to be about 26 times leſs than the Earth, yet being placed near to it in her Orbit round it is ſometimes, in her Perigeon, capable to eclipſe the Sun totally to ſome Latitudes, for her mean Diſtance is computed at about 240,000 Miles from it, at which Diſtance its apparent Magnitude is nearly the ſame as the Sun's at his Diſtance, and ſomething more in her Perigeon, and therefore when ſhe eclipſes the Sun in that Part of her Orbit, her Perigeon, or neareſt Part of her Orbit to the Earth, ſhe is then capable of totally covering

the whole Body of the Sun from our Sight, where her Parallax of Latitude carries her not to the North or South of the Ecliptick Circle, or in the Latitude where ſhe has her Node exactly in the Ecliptick.

But when at ſuch a Poſition ſhe happens in her Apogeon, or furtheſt Part of her Orbit from the Earth, then inſtead of making a total ſhe will only make a central Eclipſe of the Sun, for becauſe of her eliptick Orbit round the Earth, ſhe will then be at her greateſt Diſtance from it, and her apparent Magnitude muſt therefore be ſo much leſs, and her Body, at that Diſtance, is not proportion'd wholly then to hide the Sun, but a Ring of the Sun's viſible Body will appear round it.

It is manifeſt to common Experience, that a very large Body at a great Diſtance may be obſtructed from our Sight by a ſmall one at a near Diſtance, and as the Diſtance of the ſmall one is encreaſed or diminiſhed, ſo will the Obſtruction thereof; ſo that in Eclipſes of the Sun wherever one happens total it can be but in one Line of Latitude; and muſt alſo be at the Time when her Perigeon happens near the Place of her Node; but Northward from that Latitude, the Moon by her Parallax loſing more Altitude than the Sun, and Southward therefrom gaining more, in Propertion to theſe diſtant Latitudes, more or leſs of her Northern or Southern Edge will remain luminous.

§. 3. But

§. 3. But Eclipſes of the Moon admit of no Difference where they are viſible to the Inhabitants of the Earth, thro' different Latitudes; and the Reaſon is plain, becauſe this is occaſion'd by the Moon's falling within the Shadow of the Earth, for as far as the Earth happens to come between the Sun and Moon, at their Oppoſition, ſo far it prevents the Sun's Illumination upon it, and therefore the Return of its Reflection to the Earth; ſo that whether the Eclipſe be total or partial, its Appearance is the ſame to all Latitudes, where ſhe appears above their Horizon at the Time of the Eclipſe.

§. 4. And tho' in Eclipſes of the Sun there is a Difference to the Inhabitants of different Latitudes on this Globe, ſo that they appear greater or leſs according to their different Situations, yet there is no Difference of the View that the Inhabitants of the Moon can behold of the Eclipſe of our Earth, which muſt happen to them at the Time when we behold the greateſt Eclipſe of the Sun; for this can only be obſerved by them in a total or nearly total Eclipſe of the Sun here; for when the Shadow of their Globe, the Moon, falls upon this Globe the Earth, the Inhabitants of the Hemiſphere of the Moon towards us will behold the Shade paſs over the ſame Situations of this Earth in all Parts alike in the ſaid Hemiſphere, ſuppoſing it to be a total Eclipſe; but ſuppoſing it not total, there

can ſcarcely be any Eclipſe then to them of any Part of the Earth; only, when it happens very large and nearly total, it may give a Dimneſs of the reflected Light from the Earth to the dark Side of the Moon towards us at her Change, in thoſe Parts of the Earth that are moſt obſcured by her own Body's Interpoſition between us and the Sun; ſo that the Eclipſes of the Earth to the Inhabitants of the Moon muſt very ſeldom be obſervable, but Eclipſes of the Sun frequent; hence it is plain, that the Moon's Body is much leſs than the Earth: And therefore alſo, the Eclipſes of the Sun to the Inhabitants of the Moon, which always happen to them when the Moon is eclipſed to us, are always total to that Part of it, which appears dark and eclipſed to us, ſo that, when it is not a total, but a partial Eclipſe of the Moon, then in ſome Degrees, near the Edge of the illuminated Part of the Moon, they will only ſee a large partial Eclipſe of the Sun, and the more diſtant Parts will have it leſs and leſs, and the outermoſt perhaps may behold little or none at all.

But it appears that the Shadow of the Earth at the Moon's Diſtance is capable of eclipſing the Moon totally for about two Hours from the Time that the Rays of the Sun from the Edge thereof are capable to communicate ſufficient Light thereto, to return its Reflection therefrom, till it comes again to give Light to the firſt darkened Side, which is near three Hours from the Time

Time that that Edge enter'd into the Shade; and this ſhews, that the Bulk of the Earth is ſuperior to that of the Moon, by how much more it is capable of eclipſing the Sun to the Moon's Inhabitants more than the Moon is capable of eclipſing the Sun to the Earth's, which, as above obſerved, is only capable of making a ſmall dark Speck on the Body of the Earth, and, in a total Eclipſe of the Sun with us, will be ſeen at the Moon to paſs over ſome Parts of the Earth: But the Earth is capable of eclipſing the whole Hemiſphere of the Moon at once totally for about two Hours together.

The Earth muſt then appear to the Inhabitants of the Moon as much ſuperior in Magnitude to the Sun, as it is really ſuperior in Magnitude to the Moon itſelf; ſince the Moon, in its mean Diſtance to us, is very nearly of the ſame apparent Magnitude to us as the Sun is; for, tho', as before obſerved, the Sun is vaſtly ſuperior in Magnitude to all the Globes of its Syſtem put together, yet according to its Diſtance its apparent Magnitude will be repreſented.

§. 5. And thus the Earth appearing to the Inhabitants of the Moon of a much greater Magnitude than the Moon does to us, will give that Hemiſphere of the Moon towards us a greater Reflection of the Light of the Sun, than ſhe can poſſibly give to us, and this may be obſerved by us, when ſhe is firſt ſeen after the Change,

Change, when the dark Side towards us may be plainly ſeen to have a Light reflected into it, from that Part of the Earth towards it, that the Sun ſhines upon, which is then towards the Moon alſo; and this is vulgarly called the Circle of the old Moon.

Of the Progreſſions and Vagations of the Moon towards the Poles.

§. 6. The Progreſſions, that the Moon makes towards the North and South Poles, occaſions what is vulgarly called the Harveſt Moon, or as ſome term it the Hunter's, and others the *Midſummer* Moon; becauſe the Moon about *Midſummer*, and ſome Month's after, during Harveſt Time (from whence it receives the Terms of Harveſt and *Midſummer* Moon) is obſerved to riſe, at this Seaſon, every Year, one Night after another, when it has turned the Full without the common Loſs of Time; from which alſo it is by ſome called the Hunter's Moon, by purſuing its Time ſo cloſely in riſing one Night after another, and much nearer than at other Times of the Year after the Fulls, but at this Seaſon of the Year always happens after the Fulls, and this alſo ſome Years much more than others, ſo that ſome Years at this Seaſon it will not loſe an Hour in riſing one Night after another, of four, five, ſix, or ſeven Nights; and this will happen for four or five Years together, out of the Moon's Nineteen Year's Revolution thro'

thro' her Nodes; and this is when the Moon has the greateſt Northern Latitude in the Northern Signs; or the Signs that the Sun appears to paſs thro' in Spring and Summer; and the Moon's North Latitude in theſe Signs, from the Ecliptick, is always while her Node, the *Dragon's Head*, is placed in and running thro' *Gemini*, *Taurus*, *Aries*, *Piſces*, *Aquarius*, and *Sagittarius*; for then her greateſt Northern Declination will be in the firſt Degree of *Cancer*, where the Sun in the Ecliptick has his greateſt Northern Declination alſo, and conſequently makes his neareſt Approach in Altitude, at his Meridian, to theſe Northern Climates beyond the *Torrid Zone*. But the Moon, when her Node, the *Dragon's Head*, is in the Beginning of *Aries*, by her North Latitude in the Beginning of *Cancer*, will approach above five Degrees nearer to our Zenith in her Meridian Altitude, than the Sun does in his Meridian on the 10th of *June*: And therefore while this Node's Progreſſion is thro' *Gemini*, *Taurus*, and the latter Parts of *Aries*; the Moon's Meridian Altitude in *Cancer* will be more and more every Monthly Revolution, and when it comes to paſs *Aries* will again become leſs and leſs in her Meridian Altitude in the firſt Degrees thereof, but will there continue to be more than that of the Sun's on the 10th of *June*, till her Node aboveſaid has paſſed thro' *Piſces*, *Aquarius*, and *Capricornus*.

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And when ſhe paſſes her other Node the *Dragon's Tail*, which is always reſpected in the oppoſite Part of the Ecliptick, ſhe then paſſes from the North to the South Latitude thereof; and when the *Dragon's Head* is in *Aries*, the *Dragon's Tail* muſt be in *Libra*. Now when the Sun at this Seaſon is entering into *Cancer*, which makes our longeſt Days, our next Full Moon muſt be placed in *Capricorn*, wherein ſhe will then have her greateſt South Latitude, and conſequently, her Meridian Altitude be much leſs, *viz.* above five Degrees, than that of the Sun on the 10th of *December*, or ſhorteſt Day, as in *Cancer*, it was ſo much more than that of the Sun's in our longeſt Day, or 10th of *June*.

Hence it is plain, that the Moon at the Full in our longeſt Days in the Caſe above noted, will have the leaſt Meridian Altitude, with us, ſhe can ever come at, by the eſtabliſhed Laws of her Motion; being then in the moſt remote Southern Signs, and having there, alſo, the greateſt South Latitude, and therefore muſt make her Return both in Latitude and Declination, ſo that in this Seaſon above all her Nineteen Years Progreſſions of her Nodes, ſhe makes her moſt quick Approaches from South to North; and the quicker ſhe is in theſe Approaches by her monthly Motion in her Declination Northward, ſhe muſt thereby, after her Full, proportionably have the leſs Difference of Time in making her Appearances, one Night after

after another, above our Horizon, at this Seaſon than at any other after her Fulls the reſt of the Year.

So that, according as ſhe gains of North Latitude in the Northern, and South Latitude in the Southern Signs, ſo will the Difference be more or leſs of the Times of her Riſing one Night from another after her Fulls in our Harveſt Months of *June*, *July*, *Auguſt*, and *September*, becauſe then ſhe is always riſing from the more Southern to the Northern Signs after her Fulls; and which is a Seaſon that is moſt uſeful to the Farmer and Huſbandman that it ſhould then ſo happen.

And now the Times of her extreme Vagations are upon us, her Node the *Dragon's Head* coming to the Beginning of *Aries*, before the End of this Year, 1745, and will not be far from it at *Midſummer*, when the Moon will thereby have her greateſt Vagations or Progreſſions Northward and Southward, and will then not loſe an Hour in ſeven or eight Nights of her Riſings one Night after another after her Fulls, at the Seaſon aboveſaid.

And as it is obſervable, that the Moon at her Full about *Midſummer*, is always in the loweſt Southern Signs, or where the Sun is in Winter, ſo as the Days ſhorten every ſucceeding Full Moon will riſe more and more towards the North, till at the Shorteſt Days ſhe will, at Full, have her greateſt Northern Declination; and while her Latitude continues North in the Begin-

Beginning of *Cancer*, or while ſhe reaches *Cancer* before ſhe paſſes her Node to South Latitude, then will her Meridian Altitude in the Beginning of *Cancer*, be more than the Sun's in our longeſt Days.

We may obſerve alſo, that every Full Moon has ſuch Situation to the Sun's Setting and Riſing, that ſhe always at her Full illuminates the whole Night at all Seaſons of the Year throughout all her Revolutions.

When the Days are ſhortening the Moon is always upon her Return from Northern to Southern Declination at her Change, ſo that, after her Changes, during this Seaſon, ſhe falls lower and lower Southward, and makes two or three Settings ſo ſoon after the Sun, or ſometimes before it, that ſhe is not ſoon ſeen by us after her Change, but before the Change may be ſeen by us in a Morning, at the ſame Seaſon, a Day before ſhe changes, and this, becauſe before ſhe changes at this Time of the Year ſhe makes her Application to the Sun, from the North of the Sun's then Place: So, when the Days are lengthening, in her paſſing by the Sun at Change, ſhe riſeth into the Northern Signs, and then turning Northward of the Sun may be ſeen in an Evening the Day after her Change, eſpecially when her North Latitude at that Time favours it: Alſo, at this Seaſon, being Southward of the Sun before the Change, ſhe will not be ſeen in a Morning two, three, or four Days before ſhe changes.

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The Diſadvantages that attend the late Appearances of the Moon, after her Changes, are always compenſated or made good in the Advantages of the long Benefits in her after Fulls: And the ſwift Diſappearances of the Moon after her Fulls, when ſhe loſeth an Hour and an Half of her Riſing from one Night to the next (which happens when the Days are lengthening) theſe are alſo made good in the haſty Appearances, and more Benefits of her Preſence after her Changes, at the ſame Seaſons: The Loſs of her Riſings after her Fulls, is, when ſhe leaves Northern for Southern Declination, and the contrary of her haſty Appearances after her Change, from her then mounting from South towards North in the Zodiack, and thereby making Settings after her Changes as long diſtant as her Riſings after her Full.

Now when the *Dragon's* Head, or North Node of the Moon has paſſed thro' *Capricornus*, and his running thro' *Sagitarius*, *Scorpio*, *Libra*, *Virgo*, *Leo*, and to the firſt Degree of *Cancer*, then will ſhe never reach the Meridian Altitude of the Sun in our longeſt Day in Summer, nor ever be depreſſed ſo low in her Meridian Altitude as the Sun in our ſhorteſt Day in Winter; for while ſhe paſſes this Node in any of the Six above mention'd Signs, ſhe will then have South Latitude, when ſhe comes to the firſt Degree of *Cancer*, where her greateſt Northern Declination terminates; and therefore coming to South Latitude before ſhe comes to her greateſt

eſt Northern Declination or Progreſſion, ſhe will not, during that Seaſon, (which is one half of her Nineteen Years Revolution thro' her Nodes) riſe ſo high in her Meridian as the Sun in the longeſt Day in Summer, nor be depreſſed ſo low as the Sun in the ſhorteſt Day in Winter; for while ſhe changes her Latitude from North to South before ſhe enters the Tropick of *Cancer*, ſhe will alſo change her Latitude from South to North before ſhe enters the Tropick of *Capricorn*; and therefore will never recede ſo low as the Sun Southward, while her Node paſſes thro' the above Signs, and the Difference herein will encreaſe from its Enterance into *Sagitarius*, and thence paſſing backward to the firſt Degree of *Libra*, and when her Node, the *Dragon's Head*, ſhall come thither, ſhe will then want as many Degrees of the Sun's Meridian Altitude in her moſt Northern Declination, as ſhe exceeded it, when her Node the *Dragon's Head*, was in the firſt Degree of *Aries*; and in her moſt Southern Declinations will want as many Degrees of coming ſo low as the Sun in his Meridian in the Tropick of *Capricorn*.

Thus ſhe gradually loſeth more and more Meridian Altitude than the Sun hath in the Tropick of *Cancer*, and gains more and more then the Sun in the Tropick of *Capricorn*, as her Node, the *Dragon's Head*, paſſeth from *Sagitarius*, to the firſt Degree of *Libra*, and then as gradually returns in the ſame Proportion

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as ſhe gained more Altitude in *Cancer*, or leſs in *Capricorn*, while that Node paſſed thro' the other Signs, ſo that the Proportion bears in the two Extremes: for when this Node is in the Beginning of *Libra*, her Northern Declination in the Beginning of *Cancer*, will want 10½ Degrees of the Meridian Altitude ſhe had there when her Node, the *Dragon's Head*, was in the Beginning of *Aries*; and ſo in her Southern Declination in *Capricorn*, ſhe will then want 10½ Degrees from being depreſſed ſo low in her moſt Southern Declination, ſhe having then above five Degrees of North Latitude in the moſt Southern Signs, and as many of South Latitude in the moſt Northern; and ſhe having the ſame Degrees of North Latitude in the Northern, and South Latitude in the Southern Signs, when her Nodes were in the oppoſite Points, gives the Difference in the two Extremes 10½ Degrees in each, which make 21 Degrees of her more or leſs Progreſſions in her North and South Vagations in one Part of the Nineteen Years Revolutions of her Nodes more than the other.

Of the Government of the Tides by the Moon.

§. 7. The Tides have conſtantly obſerved the Poſition of the Moon, and have in all Ages been allowed to be governed by her; and the Reaſon why they are not only governed, but occaſion'd by her, has been by the late incom-

párable Sir *Iſaac Newton* accounted for, and made intelligible from the Laws of Gravitation and Attraction of one Body to another. Thus as the Moon's Body reſpects this Earth as its Center, and by her Gravitation towards it performs her Menſtrual Revolutions round it; ſo by the Moon's mutual Attraction upon this Earth, the fluid Part thereof, the Seas, pay their ſenſible Tribute of Gravitation towards her; ſo that round the Globe they follow the Moon's Meridian Altitude; and to that Point are ſwelled to the greateſt Height, and therefore thoſe Parts of the open Seas, that have the Moon in their Meridian, riſing much higher than their common Surface would otherwiſe be, return the Waters up the Rivers that run into the Seas in Proportion to the Level, in their orbicular Form, which they bear to the Seas, from whence they have their Returns; ſo that as far as theſe Rivers bear ſuch Level to the Swelling of the Seas (or near to it) ſo far will the Tides appear therein; and the Times of the Tides up theſe Rivers are in Proportion to their Diſtances from thoſe Seas, with which they have this Communication, and are greater or leſs according to the Nearneſs of their Level with thoſe Sea Tides, and longer or ſooner after the Moon's Southing, according to the more or leſs Diſtances of the Rivers from them; but cannot appear in any Rivers, where the Level to the Swelling of the Sea Tides is loſt.

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What Irregularities may happen to occaſion Exceptions to the above Rules, thro' the Interpoſitions of Iſlands, *&c.* may be accounted for, I doubt not, upon the ſame Principles.

Now the Reaſon why theſe Tides happen not only upon the Moon's Southing, but alſo when ſhe is in the oppoſite Point, is, becauſe of a Return that the Waters muſt neceſſarily make, when at higheſt, as the Moon, which attracted them, withdraws from the Meridian to which they had been attracted; for as ſhe continues to attract the others from the Weſtern Quarters, by her Approach that Way, ſo by her withdrawing from the Eaſtern, the Waters will conſequently return back that Way, and ſo continue till it is low Water, ſo that where it was higheſt in the Moon's Meridian, it will be loweſt with the Moon in the Weſtern Horizon, and conſequently the Waters that ſwelled by the Moon's Meridian ſend back a Tide to the Eaſtern when the Moon is in the Weſtern Horizon, nearly as big as that which accompanies her Meridian, and which will be equally obſerved round the Globe where no Obſtructions happen; ſo that the Tides in both the Moon's Zenith and Nadir muſt be nearly equal the ſame, and there can only be low Seas when the Moon is in her Eaſtern or Weſtern Semidiurnal Arches from each Meridian, and the Tides of the Rivers, as before obſerved, have their Proportional Times after the Moon's receding from her Meridian and contrary Point, according to

their Diſtances from the Seas that communicate them: Thus is the Moon's Monthly Motions, and the Earth's diurnal Rotations ſo juſtly adapted to each other, that the Flux and Reflux of the Seas are hereby, as it were, kept in a continual poizing Balance backward and forward.

An Obſervatory Recapitulation.

§. 8. Now the Light, Eclipſes, Monthly Revolutions, Progreſſions, or Vagations of the Moon towards the Poles have all their ſeveral admirable Uſes and Services to us, as if ſolely created for that Purpoſe; and our Globe the Earth as mutually returns her Services to her Inhabitants.

By the Seaſons of her Light, we are enabled to lengthen out our Days, and to purſue ſuch Concerns as Occaſions may require: And in the Abſence thereof there is yet another ſmaller Proviſion made, by the Rays of the Planets and Fixed Stars, which jointly adminiſter, in her Abſence, to preſerve the Nights from total Darkneſſes, ſo that when urgent Occaſions call Men, or other Creatures, to make Uſe of the Night for any immediately neceſſary Tranſactions, inſtead of a Time of Reſt, the joint Concurrence of the Planets and Fixed Stars, even, at their prodigious and immenſe Diſtances, are ſo far a Supply of the Moon's Abſence, that we are never deſtitute of their leſſer Lights, when both the greater are withdrawn.

Like-

Likewiſe the Eclipſes of both *Sun* and *Moon* have their ſeveral excellent Uſes: For as they are uſeful to Mariners at Sea to correct the Accounts of their Longitude by, ſo by them the moſt precarious Motion of the Moon herſelf is more and more nearly aſcertain'd, which, if once truly fixed by Calculation, ſo as to anſwer Obſervation, would be the only Means to procure frequent Opportunities for ſuch uſeful Corrections; that Mariners might make of their Longitude, by a Method preſcribed by me, and publiſhed in 1731, which had been communicated to the Great Dr. *Halley*, ſix Years before, in Manuſcript, who, when he had conſulted it, reported, that there was nothing wanting to render it the moſt uſeful Thing for that Purpoſe that could poſſibly be, but a true Adjuſtment of the Moon's Motion, which he, when he received my Projections hoped to complete by the End of the Year 1730 (as I have obſerved in my Preface to that Work) but as it happened not then fully to anſwer his Expectations, it was, by him purſued whilſt he was able; tho' he has not lived to ſee it completed; yet it may not be improbable, that ſuch a deſireable and uſeful Work may be brought to bear, and why not in the preſent Age, if truly purſued, by thoſe whoſe proper Buſineſs it is, and who have a Genius and Advantages adapted thereto.

But we find the moſt uſeful Knowledge in our preſent relapſed State can only now be attained by hard Study and diligent Application,

and generally what tends to the moſt Uſefulneſs is the moſt difficult; and which indeed is wiſely adapted by Providence in our preſent State to exerciſe our Powers and Faculties in ſuch Engagements as may prevent our ſpending too many leiſure Hours in ſuch vain Tranſactions, that our now depraved Nature's might, thro' an indulgent Indolence, excite us to: Hence ſeveral Arts and uſeful Inventions have their Riſe in one Age, and Improvements in another, tho' it be ſeldom, now-a-days, that the firſt Diſcoverers of Things, uſeful to the Publick, meet with the Encouragement they deſerve, yet as there is never wanting ſome Things uſeful to employ all Generations in, ſo there are never wanting ſome Men to employ their Time about them.

The Moon's Progreſſions and Vagations are alſo of vaſt Uſefulneſs to us upon ſeveral Accounts: By theſe Progreſſions from the Ecliptick, Eclipſes of the Sun and Moon are prevented from happening every Change and Full Moon, which would rather annoy us than excite our Curioſity: By her extreme Northern and Southern Progreſſions the Inhabitants towards the Poles have the Advantages of a better and ſtronger Light, during the Seaſons they enjoy them, at which Times alſo they will not only have the Curioſity of beholding the Moon make uncommon Approaches towards their Zenith in her Meridian, but will alſo have their Seas more purged and purified thereby.

But

But as thoſe Seas towards the Poles cannot be ſo ſubject to Filth thro' Heat as thoſe in the Torrid Zone, and as thoſe in the Torrid Zone require more Purgation by Tides, they are accordingly provided for, by the Moon's conſtant Paſſages over them in every of her Monthly Revolutions; and that the Temperate and Frigid Zones may likewiſe have as much of the Benefits of her cleanſing Influences as their Occaſions call for, ſo by her extreme Vagations to the North or South in every Nineteen Years Paſſages thro' her Nodes, the Northern and Southern Seas are thereby accordingly ſuited.

Now again, by the Moon's extreme Vagations to the North and South, if the Moon's Motion was truly aſcertained, and Tables, from thence drawn up of the Moon's daily Meridian Altitude for this preſent Year 1745, *&c.* it would be the moſt friendly Opportunity we ſhall have of Eighteen or Nineteen Years to come, to make the firſt Experiments to diſcover the Longitude at Sea therefrom, and the Advantages, at this Seaſon, from ſuch Calculations, would beſt ſuit the firſt Experiments.

And this being once render'd ſerviceable, we may ſuppoſe that the Method and Calculations may meet with ſuch Improvements, that as the Moon ſhall decline from her extreme Vagations, this Method may be ſo far improved as to render it ſtill as uſeful throughout the reſt of her Nineteen Years Revolutions: and that further Improvements may be made upon her next

Return to her moſt Northern and Southern Progreſſions.

The Reaſon why I recommend this Seaſon as moſt proper for this Purpoſe, may appear plain, from the Projection I publiſhed, before-mention'd, in the Year 1731, which was to diſcover the Longitude at Sea from the Altitude of the Moon at the Time of her Southing: Now the Variation of her Altitude upon her extreme Vagations when quickeſt muſt be moſt ſenſibly perceived between the Meridians of Calculator and Obſervator; and the Obſervator may then with the leaſt Difficulty diſcover the Difference between her Altitude at the Place of Calculation, and her Altitude in a Parallel of Latitude to the given Place under the Meridian ſhe is then in, and from thence beſt correct his Accounts of his Longitude.

As therefore, at this Time, the Moon is haſtening to her extreme Vagations to the North and South, I recommend it as the moſt proper Seaſon to put this Method upon Experiment, provided, as I before hinted, it can be depended on, that her Motion is as yet truly (or very near to it) aſcertained (which I leave to thoſe, whoſe proper Buſineſs it is to improve upon Dr. *Halley*'s Searches after it) for at this Seaſon her North and South Declinations being the quickeſt, the gaining or loſing of her Altitude will be much more diſcernable than when her Nodes are in the contrary Points; and muſt therefore be the fitteſt Opportunity to lay a Foundation for this Diſcovery. Co-

COROLLARY.

And now! what Power leſs than abſolutely infinite, could be the Author of ſuch beautiful Chains in the Productions of the Material Creations? which admirable Works declare, and teſtify to every intelligent Being the ſurprizing Wiſdom and Goodneſs, as well as Power of our GREAT CREATOR; from the ſerious Reflections of which our Hearts may well be raiſed and elevated, and our Tongues be moved with Songs of Praiſe, and our Deſires enflamed to continue in everlaſting Hallelujahs to that Author of all Things, and incomprehenſible Fountain of all Perfection.

Thus having taken a tranſient View of the exceeding Uſefulneſs of the Sun and Moon, the two great Lights, I ſhall next proceed to conſider ſome Things relating to the other primary and ſecondary Planets of our Syſtem. And next

CHAP. X.

Of MERCURY.

§. 1. THIS Planet's Orbit is neareſt to the Sun, and is therefore but very ſeldom ſeen by us, becauſe the Orbit of our Earth is near three Times the Diſtance from the Sun; ſo that

that the Advantages that we have of ſeeing and obſerving *Mercury*, can only happen upon the following Situations. *Firſt*, In the Spring of the Year, in his greateſt Elongation from the Sun, he having then North Latitude, when occidental, or our Evening Star: In this Poſition, by mounting Northward of the Sun, he may be ſeen in an Evening.

Again in the Autumn, when *Mercury* happens to be in the other Part of his Orbit, and riſes before the Sun, or is oriental, and in his greateſt Elongation, has North Latitude alſo (which the more the better) he having thereby the Advantage of riſing more Northward than the Sun, will conſequently riſe the longer before him, and give us the Opportunity to ſee him in a Morning. But when at either of theſe Seaſons, *Mercury* happens to have South Latitude, in the firſt Caſe he will be hurried to ſetting after the Sun, or in the other depreſſed from riſing before the Sun ſo far that the Sun's Light, that ſucceeds and precedes his Preſence, will render *Mercury* inviſible to a naked Eye.

Another Way to obſerve *Mercury* may be from his Tranſits before the Face of the Sun, when in his Orbit he paſſes on this Side towards the Earth, and at the ſame Time is not carried by his Latitude to the North or South of the Sun's Body, at which Time, by the Help of a ſmoaked Glaſs in an optical Inſtrument, he may be ſeen to make a dark Speck on the Body of the Sun.

OBSER-

OBSERVATION I.

§. 2. From this it is plain, that *Mercury* reſpects the Sun as his Center, and performs his Revolution round it, and that his Poſition is the neareſt, of all the Planetary Orbs we know of, to the Sun; notwithſtanding, as I obſerved before, we may very reaſonably conclude, that the Denſity of his Body and Atmoſphere is ſo proportion'd to his Diſtance, as to ſecure his Vegetables and Inhabitants, altho' conſiſting of the four Elements, from any intolerable Effects of the Sun's ſcorching Heat, or too dazzling Luſtre.

OBSERVATION II.

§. 3. It is further obſervable, that *Mercury* appears no further illuminated to us, than that Part of his Body, which the Sun ſhines on, and that the other Parts remain unenlightened, and therefore ſhews it to be an opake Body, as the Earth and Moon; and there is alſo the ſame Agreement in all the Planets of our Syſtem, as will be ſhewn in their proper Order.

OBSERVATION III.

§. 4. Mr. *Harris* has computed *Mercury*'s Diſtance from the Sun to be about 32 Millions of Miles, and his Diameter, by our modern Aſtronomers, is computed at 2748 Miles, ſo that both his Diſtance from the Sun and his Magnitude are nearly three times leſs than the Earth's;

Earth's; and his Revolution is perform'd, about the Sun, in about 88 Days.

Observation IV.

§. 5. By *Mercury*'s Tranſits before the Sun's Face, his Motion and Times of his Periodical Revolutions are aſcertained, which would have been more difficult to diſcover from his other Appearances, which are very rare and ſhort. His Periodical Motion likewiſe being aſcertained, his Tranſits over the Sun's Body may be truly calculated.

Observation V.

§. 6. But our Globe, the Earth, more than doubly returns the Services of *Mercury* to her, as well as ſhe does thoſe of the Moon; nay, this Earth is ſo ſituate, with her Moon, as to perform ſuch uſeful Services to *Mercury*, *Venus*, and *Mars*, which may, as far as is neceſſary for them, ſupply their Wants of Secondary Attendants. For,

Both to *Mercury* and *Venus* the Earth always gives an Illumination to the darkened Side that reſpects her, and *Venus* alſo joins with the Earth to illuminate *Mercury* in proper Poſitions, and may be ſingly ſerviceable to *Mercury* at one time, and the Earth at another, they being both of them much larger Bodies than he *is*, and our Moon will alſo be as ſerviceable to both *Mercury* and *Venus*, as *Venus* is to us; as when ſhe is

is at Change to us, and then finds *Mercury* or *Venus* on this Side the Sun they will have their darkened Hemiſphere towards the Moon, with her full enlightened Hemiſphere towards them, with this Advantage alſo of their neareſt Proximity to each other, for in this Poſition they will be nearer to each other, than in the contrary, when the Earth and Sun are between them, by the whole Diameters of both their Orbs, in which Poſition our Moon will be more beneficial to *Mercury* than *Venus* is to us, and much more ſo to *Venus* by her much nearer Approach. Thus the Deficiencies of a Secondary Attendant are made good, and all the Occaſions of their Seas being purged by Tides may alſo be thereby anſwered. But more concerning their Advantages to *Mars*, when I come to treat of him by himſelf.

COROLLARY.

Hence we behold a wonderful Scene of Providential Care, in the wiſe and great Ends of ordering the united Services amongſt the Works of the inanimate Globes of the Creation by their mutual Returns of ſilent Gratitude!—Oh! how becoming the Dignity of an all wiſe beneficent Creator, are ſuch harmonious Concords! Let the intelligent Creation be inſtructed by the ſilent Language of the inanimate Bodies of the Univerſe! Rouſe, O Man, and be amazed at thyſelf, if thou canſt for Shame let the inanimate World reprove thee for thy being made ratio-

rational! Let not thy Reaſon ſink thee below thy Rationality, but let Rationality raiſe thee above Senſuality, and learn to direct thy Reaſon by the Dictates of the inanimate Globes.

CHAP. XI.

Of VENUS.

§. 1. NEXT to *Mercury* is the Orbit of *Venus*, which is alſo within the Orbit of the Earth, and reſpects the Sun for her Center, which is ſtill a further Confirmation of the *Copernican* Syſtem, and that the Earth is another Planet revolving round it by an annual Revolution, and upon its own Axis by a diurnal Rotation, which Motions, all the Planets, that we have any Means from Obſervations to diſcover this from, are all found to perform: And that this is obſervable in *Venus*, *Monſ. Caſini*, from the Spots on her Body ſhifting Poſitions, aſcertained that ſhe had a diurnal Rotation, tho' he could not exactly adjuſt the Time in which it was performed. But ſome of our later Aſtronomers have determined it to be performed in about 23 Hours.

§. 2. But as *Mercury*'s Proximity to the Sun has deprived our Obſervators of diſcovering his diurnal Rotation, we can only judge, that as

as all the primary Planets that come within the Reach of our Obſervations are found to have theſe Motions, it is from thence moſt probable, that *Mercury* has likewiſe.

But as our Attendant the Moon has only a Diurnal Rotation exactly commenſurate with her Menſtrual Revolution, (the Benefits of which, in the Secondary Planets, I ſhall diſtinctly conſider when I come to treat of *Jupiter's Satellites*) and as *Mercury's* Orbit is next to the Sun, and his Periodical Revolution performed in a proportionate ſhorter Time than thoſe more diſtant, it cannot be fully concluded, but that he may have only a Periodical Motion without a diurnal Rotation, and his Days and Nights only proportion'd to his Annual Revolutions: But as I cannot pretend to determine this, I ſhall only obſerve, that whatever his Motion is, or Motions are, we may certainly conclude, that they are as juſtly proportion'd as the reſt of the Works of infinite Wiſdom, Power, and Goodneſs, to ſuit all the Occaſions of his proper Inhabitants.

§. 3. Now the Orbit of *Venus* is at a proper Diſtance from *Mercury's*, being computed by Mr. *Harris* at 60 Millions of Miles from the Sun, which is 28 Millions of *Engliſh* Miles without the Orbit of *Mercury*, and above 25 Millions of Miles within the Orbit of the Earth and Moon; ſo as her Orbit is on the Outſide of the one, and on the Inſide of the other, ſhe becomes

becomes uſeful to them both; and they as mutually return her Services into her own Boſom.

Her Periodical Revolution is performed in ſomewhat above 224 Days, but thro' the Revolution of the Earth alſo round the Sun, her Diſtances of Conjunctions with the Sun are about 290 Days, and as her Orbit is nearer the Sun than the Earth's, ſo is her Revolution round him ſooner performed.

In her Elongations from her Conjunctions with the Sun with Reſpect to us, ſhe becomes our Morning Star after ſhe has paſſed her Conjunction with him in the remoteſt Part of her Orbit to the Earth; and our Evening Star after ſhe has paſſed her Conjunction on this Side of her Orbit towards the Earth: And upon this Paſſage by the Sun, when her Latitude North or South carries not her Body above or below the Sun's, ſhe may be obſerved by Glaſſes to appear a dark Spot on the Sun's Face; tho', during her greateſt Elongations from the Sun, when our Morning or Evening Star, ſhe reflects ſo ſtrong a Light, that our Shadows againſt a Wall may be plainly ſeen by it.

Thus, when our Morning Star, ſhe adds to the Benefit and Pleaſure of ſuch, whoſe Occaſions call them to riſe early, when the Moon does not illuminate the Morning; and, when ſhe is our Evening Star, ſhe performs the ſame Advantages to thoſe whoſe Concerns require them to lengthen the Day with the Evening.

§. 4. But

§. 4. But theſe Services are above doubly return'd to *Venus*, and her want of a Moon, or Secondary Attendant ſupply'd by the Advantages of her Situation between the Orbits of *Mercury*, and our Earth and Moon, all which very much adminiſter to her neceſſary Occaſions in Profits and Pleaſure; as may be underſtood by imagining ourſelves upon that Planet, *Venus*, to view the Earth, the Moon, and the Planet, *Mercury*, as they do there appear in their Revolutions.

The Earth being of a ſuperior Bulk to *Venus*, when *Venus* is in Conjunction with the Sun on this Side her Orbit to the Earth, or near that Poſition; the Earth then, to an Eye at *Venus*, will be in Oppoſition to the Sun, and will appear as luminous to the benighted Hemiſphere of *Venus*, or very near to it, as the Moon at Full appears to us; and then alſo while the Earth continues in near this Poſition to *Venus*, our Moon, at Change, by her near Approaches towards *Venus*, with her enlightened Hemiſphere towards *Venus*'s benighted one, will alſo appear thereto very luminous.

So that *Venus*, who has no ſecondary Attendant, has almoſt as good as two Moon's in their Seaſons; which may alſo anſwer in the Services of raiſing her Tides, and cleanſing her Seas, as much as Occaſions may require.

Mercury would alſo be obſerved of the ſame Services to her, as ſhe is to the Earth, in becoming her Morning and Evening Star; for by her being placed nearer to him, ſhe will behold

him in his Elongations from the Sun, with reſpect to his Poſition to herſelf, in his Orbit, with as much Luſtre and Brightneſs, as we, upon theſe Poſitions, do behold her here.

§. 5. Now altho' *Venus*, in her greateſt Elongations, appears with ſo much Luſtre, yet we have not then much above one Half of her Body that then appears to us enlightened by the Sun, as may be ſeen with good Glaſſes, and likewiſe agree with reaſonable Examination upon her then Poſition; for in this Poſition of her to the Earth, we muſt behold her in an oblique Angle to the Sun, by which Obliquity we may behold ſomething more than half her Body enlightened, and as her Diſtance from us encreaſes, when our Evening Star, the more of her illuminated Hemiſphere appears to us, in about the ſame Proportion as her greater Diſtance would cauſe her Body to appear leſs; ſo that, to the naked Eye, her Body always nearly appears of the ſame Magnitude, while ſhe is by her Diſtance from the Sun, with reſpect of her Poſition to us, either our Morning or Evening Star; for, in all Parts of her Orbit, the nearer ſhe approaches the Earth, the leſs we can behold of her illuminated Body; and the further ſhe removes from it, the more we ſee thereof, and in ſuch like Proportion, as above noted, that her Magnitude, by her Illumination, is nearly the ſame to common Appearances; from whence that vulgar Error, that *Venus* always kept the ſame Diſtance from the Earth, might ariſe. §. 6.

§. 6. The dark Spots obſervable in *Venus*, the Moon, and the reſt of the Planets, from which their Rotations are diſcovered, are the Seas, or Collections of Waters, upon thoſe Globes; ſimilar to thoſe on the Earth.

For that the Waters cannot retain the Rays of the Sun, ſo as to reflect them in any Poſition but ſtraight Lines, is manifeſt; and that ſtraight Lines of Reflection, at ſuch Diſtances, are quite loſt: But the opake, ſolid Lands, which only receive the Light on the Surface, diffuſe the Reflection to all Places alike that fall within View and proper Diſtance. Thus a Candle, in a proper Poſition to a Looking-glaſs, will have its Light received and reflected in one direct Line only, but out of that Line the Looking-glaſs appears the darkeſt Part of the Room; but the Wall in every Part of the Room will reflect the ſame Light to all Beholders of it in every Poſition.

MEDITATION.

Let the Contemplations of theſe admirable Works, of infinite Wiſdom and Goodneſs, be our conſtant Monitors, to eſtabliſh our Reſolutions of Perſeverance in Duty and Obedience to the Author of them, as the inamimate Globes do preſevere in harmonious Order and punctual Conformity to their eſtabliſh'd Laws.

And tho' we now behold theſe Things only, as *thro' a Glaſs darkly*, yet we may conclude, that

what we ſee now obſcurely, will be made clear and perſpicuous to us, when we become looſed from the preſent Impriſonment of this Veil of Fleſh and Blood. Then, with what Raptures of Pleaſure and unparallelled Delights will our Souls be filled, to give Life and Energy to our Songs of Praiſe, when no Obſcurities of our preſent Senſualities are left to obſtruct, or contract our everlaſting Admirations, and true Enjoyment of that ſupreme infinite Creator, who has ſo admirably adjuſted his wonderful Works, which will then appear in their proper Beauty; and we ſhall no longer be liable to Miſtakes and doubtful Hypotheſes concerning them, to which, after all our Reſearches into them, we are now forced to leave them?

For here we are only afforded a Glimpſe of them, to excite our Longings after a full Acquaintance with them; becauſe we are deſign'd for another State, for which the fuller Knowledge and Fruition is reſerved; that as we muſt be removed from hence, we may not fix our Minds on this preſent World, but be preparing to leave it with Reſignation, when we ſhall have finiſhed the Work we were here appointed; and may we here for ever preſerve a well eſtabliſhed Hope of ſeeing that perfectly in uncreated Light, which we can now only behold at a limited Diſtance.

For if it be ſo delightful to converſe, even at this Diſtance, with the Glories of the heavenly Bodies, while confined to one of them, in its ter-

terreſtrial Conſtitution; how tranſporting muſt it be, when we come to be releaſed from this One, and converſe amongſt all, that we have, or have not now any Acquaintance with; and then, not in Imagination only, but in clear Speculations alſo?

Let it then be our conſtant Reſolutions to perſevere in Religion and Virtue, that we may never endanger our Impriſonment in eternal Darkneſs to deprive us of the Enjoyments of theſe bleſſed Views; for by ſuch a Perſeverance we ſhall enjoy more Peace here and Pleaſures hereafter than our Imaginations at preſent can arrive to the Idea of.

But I cannot now dwell long upon theſe Flights of Contemplation ſince I find them far above my preſent Sphere, and Fleſh and Blood remand me back to that narrow Globe, whereto I am confined. I muſt therefore return, and only content my ſelf to view theſe Glories as I can now behold them in Imagination only, and under the want of more perfect Knowledge. I ſhall next take a View of the Orbit, &c. of *Mars*, which is deſcribed next to the Earth's, more diſtant from the Sun.

CHAP. XII.

Of MARS.

§. *MARS* performs his periodical Revolution about the Sun in 687 Days, which wants about 43 Days of 2 of our Years; and

according to Mr. *Huygen*'s Calculation, he is 24 Hours and 40 Minutes in completing his diurnal Rotation.

And as *Venus* has her Orbit nearer the Sun than our Earth, ſo this Planet's Orb circumſcribes ours, but has no ſecondary Attendant or Moon: Nor can the Earth ſupply that Defect; yet the Earth is not without her Services to *Mars*, even more than he is to this Earth; for as the Earth is of ſuperior Bulk to *Mars* (nearly double, as Mr. *Harris* has computed it) ſhe will be at leaſt as luminous to *Mars*, as *Venus* is to us, and perform the ſame Services to him in becoming his Morning and Evening Star. His Diſtance from the Sun M. *Harris* has alſo computed to be 123,000,000 Miles.

§. 2. Now when *Mars* is in Oppoſition to the Sun, with reſpect to us, he then being in the neareſt Point of his Orbit to the Earth, will, in this Poſition, appear, at leaſt, with 9 Times the Luſtre, as he does, when removed by his, and the Earth's Revolutions to a Quadrature to the Sun, when he is thereby at a much further Diſtance from the Earth; and which Luſtre ſtill decreaſes with his Diſtance in his receding to the other Part of his Orbit beyond the Sun, while he may be ſeen in an Evening, and again as gradually encreaſes in Luſtre, after he comes to be ſeen in a Morning, when he has paſſed his Conjunction with the Sun, till he comes again to his Oppoſition; which proves, that he alſo reſpects the Sun, and not the Earth

as

as his Center. For if the Earth had been the Center of his Orbit there could not have been theſe different Appearances of *Mars*'s Magnitude and Luſtre. Since then it is plain, that *Mercury*, *Venus* and *Mars* do manifeſtly reſpect the Sun, and not the Earth, as their Center, and that the Earth is ſo ſituated amongſt them, *viz.* between the Orbs of *Mars* and *Venus*, that, even this, ſufficiently demonſtrates the Truth of the *Copernican* Syſtem; that the Earth is a Planet like them, and they Globes ſimilar to the Earth, whoſe Motions and Phænomena are analogeous to each other.—But this Remark is more Accidental than Intentional, becauſe, as I before obſerv'd, I have purpoſed to look upon the contrary Notions now given up by Men of Learning.

But again, when *Mars* is, to us, in Oppoſition to the Sun, the Earth and Moon muſt be in Conjunction with the Sun to him, ſo that when we have the greateſt Benefits of his Illumination, he has no Returns thereof from our Earth and Moon, but muſt wait for what Advantages he can enjoy that Way till the Earth and Moon, by their ſhorter annual Revolutions, appear to him in oblique Angles from the Sun, and become his Morning or Evening Stars, at which Seaſons he will enjoy the ſame Benefits, particularly from the Earth, as has been obſerved of *Venus* to the Earth: But as *Venus*, and *Mercury* are ſo far diſtant from, and within the Orbit of *Mars*, 'tis almoſt impoſſible for

Mercury to come within his View, ſo *Venus* will only come about as near his Obſervations as *Mercury* does within ours.

However, as the Earth is a much larger Body than *Mars*, ſhe may, in her Conjunctions with the Sun, or neareſt Approaches to *Mars*, together with the united Forces of the Moon, which then at her Fulls to us will make neareſt Approaches to him, tho' both the Moon and Earth, in this Poſition, have both their darkened Hemiſpheres towards him, yet their united attractive Powers, will, during theſe Seaſons, have ſuch forcible Influences upon his Seas, as may be of particular Uſes to him. To which add,

§. 3. The paſſing his Conjunctions of *Jupiter* and *Saturn* with their Satellites, which Paſſages by *Jupiter*, in the neareſt Point of his Orbit to him happen in two Years and about one Month; and with *Saturn* in about two Years; and this every twenty Years happens with both together, and their Diſtances encreaſe and decreaſe in the Intervals; ſo that whether they unite their Forces upon *Mars*, or he has them ſeparately at diſtant Times, their Forces will be leſs, but oftener, when ſeparate, and ſtronger, but ſeldomer, when united; for their Forces when united, tho' they more rarely happen, will more forcibly purge the Seas in *Mars*, and when they become ſeparate, will the oftener return with a leſſer Power, and the one make

make good the Deficiencies of the other, and theſe together with the Earth and Moon's Services, before-mention'd, may be ſufficient for what is neceſſary to that Planet for ſuch Purpoſes: And we may from the Great Creator's Wiſdom, diſcoverable in all his Works of which we have any adequate Underſtanding, aſſure ourſelves that a true Adjuſtment of neceſſary Proviſion thro' his whole Creations, that will beſt and moſt wiſely ſuit all their Occaſions, is effectually taken Care of.

Alſo upon the Seaſons of *Mars*'s neareſt Approaches to *Jupiter* and *Saturn*, *Mars* has the Benefits of their ſtrongeſt Illuminations to his benighted Hemiſphere, and perhaps of ſome of *Jupiter*'s Moons, tho' perhaps not of *Saturn*'s: But he can return no other Services to them than, if he was worth their Notice, to become a ſmall Morning or Evening Star, tho' I queſtion whether that, nor do they want any Service or Aſſiſtance from him, they being much better provided for by their Moons, or Satellites; of which in the Courſe of their Views.

REFLECTION.

§. 4. Why *Mars* is not ſo well provided for in his Night's Illuminations as the reſt of the ſuperior Planets and this Earth, I cannot pretend juſtly to determine; but if I may be allow'd to gueſs: If it was warrantable to ſuppoſe, as many have not bluſhed to affirm, in an Aſtrological

trological Way, that *Mars*, even, by his Influence excites all our Nations to Wars and Bloodshed; and were we from thence to ſuppoſe, that his Inhabitants, agreeably to his Influence were of ſuch quarrelſome Diſpoſitions, it would certainly be Wiſdom to confine thoſe Inhabitants to Works of Day-Light, and not to give them Opportunities to lengthen their Diſcords by nightly Illuminations; for if the Inhabitants of that Planet be given more to Wars, Confuſions, Diſorders and Bloodſhed, than the Inhabitants of this our Earth, I think, they ought to have no Moon, by whoſe Light they might lengthen their Diſorders. For as our Diſcords, Wars and Confuſions upon this earthly Globe are ſo great and ſo many, ſo, I think, it is a Mercy we have only one Moon in her Seaſons, and have no more to ſupply its Abſence in every Night.——But let us beware we exceed not the Inhabitants of *Mars* in Feuds, Wars and Quarrelling, and be no longer able to lay the Blame upon his Influence, leſt it ſhould be juſt with God to withdraw even this one Moon which we now enjoy from us, and beſtow her upon *Mars*, which, by a Divine Appointment, *Mars* might eaſily run away with.

Let us then behave with the utmoſt Gratitude for the Benefits we receive from our indulgent Creator, and in Imitation of his tender Mercies over all his Works, let Love and Good Will appear in all our Tranſactions one with another, whether in Communities, Common-Wealths,

Wealths, or Kingdoms; or as Men in private Capacities.

CHAP. XIII.

Of JUPITER.

§. 1. THE Orbit of *Jupiter* circumſcribes the Orbit of *Mars*, and *Jupiter* is attended with four Moons or Satellites, and there is only *Saturn* and his Moons that perform their Revolutions round the Sun at a farther Diſtance from him: And theſe within the Orbit of *Jupiter*, *viz.* *Mars*, the Earth, and Moon, *Venus* and *Mercury*, as I apprehend, are of no Service to him, but beneath his Notice: For *Mars* and the Earth that are the neareſt and largeſt of them, could only, in their Seaſons, become his Morning and Evening Stars, ſuppoſing their Magnitudes ſufficient to give his Inhabitants a View of them: But in all Probability at their Diſtances from him they will be inviſible to a naked Eye there, ſince the Earth itſelf is by Mr. *Huygens* computed to be 400 times leſs than *Jupiter*, and that ſome of his Moons are at leaſt as big, or bigger than this Earth, which, at his Diſtance from us, we cannor at all diſcover by the naked Eye, and we have double the Advantage to behold *Jupiter* and his Moons, as it is poſſible *Jupiter*'s Inhabitants can have to behold our Earth either with or without optical Helps.

But

But if thro' the Advantages of his Atmoſphere's more entertaining Medium for Light (of which more hereafter) his Inhabitants could ſee our Earth, as well as we can ſee his Satellites thro' a Teleſcope, yet the Advantages of frequent or long Views either of *Mars* or the Earth, would be wanted to *Jupiter*'s benighted Hemiſphere; or probably the Light of his Moons may make them diſregarded.

§. 2. *Jupiter*'s Diſtance from the Sun is computed to be 343 Millions of Miles further than the Earth is, yet, as I have before obſerved, thro' the leſs Denſity of his Body and Atmoſphere, the Rays of the Sun may be therein entertained with the ſame Heat and Light, as it is upon this Globe, and which it is highly reaſonable to believe it is: For,

Suppoſe his Denſity was the ſame with the Earth, and that he only receiv'd a proportionate Light and Heat to his Diſtance, then, as Dr. *Derham* accounts in his Aſtro-Theology, the Sun's Light and Heat would be 27 times leſs there, than with us, and his apparent Magnitude five times leſs: But why may not his Atmoſphere as well as our Glaſſes augment his apparent Magnitude?

By concave Glaſſes we can collect and reflect the Sun's Rays of Heat to ſuch a prodigious Degree, as to augment them to that impregnable Force to melt the hardeſt metallick Bodies, almoſt in a Moment; and if the Art,

God

God has given to Man, can thus unite the Sun's Rays, and render them ſo irreſiſtible, can it be thought improbable that God ſhould ſo adjuſt the Atmoſpheres of all the Planets to their Diſtances, in the Entertainment of Light and Heat, in ſuch due and proper Portions that ſhall be ſuitable to all Animal Inhabitants, and Vegetables, conſiſting of the four Elements: And that God has ſo order'd it, I think, will further appear,

From the luminous Brightneſs with which *Jupiter* returns his reflected Light, even, at ſuch a vaſt Diſtance; for, if according to that Diſtance, he receiv'd 27 times leſs Light and Heat than we, being no better qualify'd to collect it from the Sun than our Globe and Atmoſphere is, it would be far from appearing to us by Reflection with ſo much Luſtre and Brightneſs as we now behold it: His luminous Appearance then at ſuch a Diſtance muſt demonſtrate that his Body, thro' his Atmoſphere does actually receive a more ſplendid Brightneſs from the Sun than that would be which is 27 times leſs than the Earth receives from it; for was *Jupiter* to receive no more than that Proportion, he could only return it in the Proportion he received it, which would be ſo languid and dim that, at ſuch a Diſtance, it would hardly be diſcern'd.

§. 3. And that he is no tutelar Sun, and only reſpects the primary One as a Center, to whom, with

with his Attendant Planets he is only obliged to pay the Tribute of Gravitation, but gives Light and Heat to his own Attendants himſelf: I ſay, that he is not ſuch a tutelar Sun, is plainly demonſtrable, from his Bodies ſhade eclipſing his Moons when it comes between them and the Sun: But if *Jupiter* was a tutelar Sun himſelf they would not be ſhaded by his Interpoſition between them and the Sun,

It muſt be therefore plain that he himſelf receives his Light from the Sun, and has frequent Returns of Day and Night by his diurnal Rotation, which Monſ. *Caſſini* has obſerved to be performed in 9 Hours and 56 Minutes, which quick Rotation may alſo be an Help to him to collect Heat from the Sun, by his quick Returns to viſit all the habitable Parts of his Globe.

But, as I obſerved before, it does not appear that he can enjoy any viſible Benefits from any of the Planets, whoſe Orbs are nearer the Sun than his own and Attendants, ſince thoſe within his Orbit are both of ſo much leſs Magnitude, and at ſo great a Diſtance.

But this Deficiency is abundantly made good to him, as before noted, in his four Moons, by whoſe Revolutions his benighted Hemiſphere is ſeldom if ever without Illuminations by ſome of them: And by their Northern and Southern Vagations and Progreſſions towards *Jupiter*'s Poles his Seas will be ſufficiently purged and cleanſed by Tides in all his habitable Parts.

§. 4. Now

§. 4. Now as *Jupiter*'s Inhabitants have very ſeldom, if ever, any Obſervations of any of the Planets nearer to the Sun, and can only behold the Moons that accompany him, and at ſome Seaſons *Saturn*, and perhaps ſome of his Moons, when they become proper, by their Poſitions, for ſuch Obſervations, thro' their Revolutions round the Sun, &c. So the Inhabitants of *Jupiter* and his Moons will, probably, look upon their own Globe, and Moons, that attend them with their caſual Views of *Saturn*, and ſuch of his Moons, if any, they can diſcover, to be the only Globes belonging to the whole Syſtem of the Sun.

Once in about 20 Years the Inhabitants of *Jupiter* have Opportunities of the neareſt Proſpect of *Saturn*, by their periodical Revolutions; for as *Jupiter* performs his Revolutions in about 12 Years and *Saturn* in about 30, ſo when *Jupiter* paſſes his Conjunction with *Saturn*, in 12 of our Years after, he comes to the ſame Point again; during which Time, *Saturn* has only moved in his Orbit between 4 and 5 twelfths, ſo that it will be 3 Years longer before *Saturn* will be moved 6 twelfths or one half of his Orbit, at which time *Jupiter* will be moved 3 twelfths of his next Revolution, ſo that they then come to Quadrature, and will not come to another Conjunction in leſs then about 5 Years more; and upon this Quadrature *Saturn* will riſe to the benighted Hemiſphere of *Jupiter* about

about Midnight, and may become visible to his Inhabitants, when the superior Lights of his Moons admit it, and continue ascending from his Rising till the Approach of the Morning, when the Light of the Sun shall deprive them of any further View thereof at that Time.

And as *Jupiter*, by his quicker Revolution shall yet approach nearer to *Saturn*, they will behold him plainer and plainer, and see him rise sooner, and in the 5 Years afterwards will overtake him again in Conjunction; and then *Saturn* will appear to *Jupiter* in Opposition to the Sun, when he will rise as the Sun sets; and at this Opportunity (he being in the nearest Point of his Orbit to *Jupiter*) *Jupiter*'s Inhabitants may have a Sight of some of *Saturn*'s Moons, or if they have the Help of optical Instruments, as we have here, they will have a more particular View of them all than we possibly can, when the Light of their Moons does not prevent it: And for the 5 Years succeeding this Conjunction, *Saturn* will rise more and more before the Sun sets, till he shall appear in the Meridian as soon as the Night admits the Sight of the Stars, and will sooner and sooner set after the Sun, till he become again very little and at last not observable for the greatest Part of the last ten Years.

§. 5. I have before observed, that it is highly improbable that the Inhabitants of *Jupiter*, and of his Moons, should have any Knowledge of these inferior Globes, from their much lesser Magni-

Magnitudes and vaſt inward Diſtances from him, and upon theſe Accounts I may alſo further obſerve, that even upon paſſing their Conjunctions with the Sun, with their Bodies towards *Jupiter*, and when their Latitudes carry them not to the North or South of his Body, that it is, even then, very queſtionable (ſuppoſing them to be fitted with proper optick Helps) whether they would appear ſo as to make a dark Speck upon the Sun's luminous Face, as *Venus* and *Mercury* do to us.

§. 6. So that, if they have no other Means of attaining Knowledge of other Globes than we have, they may not imagine that there is any between the Sun and themſelves, except their own Moons: And their Obſervations of *Saturn*, and now and then, what they can diſcover of his Moons; and the Seaſon when they can ſee nothing of him or them, may probably give their Inhabitants ſeveral uncertain Conjectures concerning them, which may, amongſt them, be as much or more Matter of Speculation and Controverſy than ever our own Globe has been ſubject to, in Conteſts about the *Ptolemaic* and *Copernican* Syſtems, *&c.*

So that the Notions there between Realities and common Appearances (if they have not ſome extraordinary Helps more than we are acquainted with to diſtinguiſh between them) ſeem to be more difficult for them to come at, than it is for us, ſince we have the Opportu-

nities of a more ſpacious and viſible Apparatus of the Globes of the ſolar Syſtem, we being nearly placed in the Middle of it, and thoſe we have nearer the Sun tho' of leſs Magnitudes, yet we are not removed ſo far from them, as for them to become inviſible to us, and thoſe that are placed to circumſcribe our Orbit of the Earth, the moſt diſtant of them are of Magnitudes ſufficient to appear (eſpecially the Primary Ones) to our View and Obſervations; and tho' there ſhou'd be others we have no Acquaintance with at more or leſs Diſtances, yet we may reaſonably conclude, that they can have no Acquaintance with our Globe, or with any that are nearer the Sun than themſelves; and therefore the Diſtinction between Realities and common Appearances ſeems to be more difficult for them to aſcertain.

§. 7. For ſuppoſe we had been born upon that Globe, with the ſame Faculties of Reaſon and Intelligence, which we now enjoy, and no better, and there obſerved Things in their common Appearances, what ſhou'd we judge of the Sun, who afforded us Days of Light and Heat; and of the Moons which gave us nightly Illuminations, and of *Saturn*, which we ſometimes obſerved with his attendant Moons and amazing Ring?

Here the Sun appears with a violent rapid Motion to run round the World, and the Globe we live upon appears to have no Motion at all

as

as we can obſerve; muſt it not then be according as it appears to our Senſes? We could not move from this Globe to another to ſee whether our Senſes deceiv'd us, and ſhould then moſt probably imagine that we were not only in the very Centre of the Univerſe, but of the very Syſtem alſo to which we belonged, and that the Globe, we were ſo placed upon, was fixed, ſtable, and immoveable, as firmly as it has been believed that this Globe was. But here, we are well aſſur'd, that it is the Rotation of *Jupiter* that gives his Riſing and Setting there, with their Returns of Days and Nights; becauſe by the Help of good Glaſſes we can, at this Diſtance, diſcover his diurnal Rotation, and obſerve it to be performed, as before noted in 9 Hours, and 56 Minutes.

§. 8. His firſt Satellite performs her periodical Revolution about *Jupiter* in 42 Hours and 29 Minutes, or in 4 of *Jupiter*'s Days, 2 Hours, and 45 Minutes; His ſecond Satellite performs her Revolution about him in about 3½ of our Days, which is about 8½ of *Jupiter*'s: His third Satellite is ſomewhat above 7 of our Days, or about 17 of *Jupiter*'s, in performing of her Revolution; and his fourth or moſt diſtant Satellite is near 17 of our Days, or about 41 of *Jupiter*'s in the Performance of her periodical Revolution. So that during the Revolution of this his moſt diſtant Satellite his firſt will have paſſed about 9 Revolutions; his ſecond, 5; his

third about two one half; from whence ſuch a Variety will ariſe in their Riſings and Settings, that *Jupiter* will ſeldom fail to have his Nights enlightened with ſome of them in every Part thereof.

Now the daily apparent Motions of theſe Satellites at *Jupiter* will be various, and the moſt diſtant, that takes the longeſt Time to perform her Revolution in, will appear to perform her daily Courſe to the Inhabitants of *Jupiter* the quickeſt; and conſequently the neareſt, the ſloweſt; and this becauſe ſhe is quickeſt in her Revolution round him and thereby follows the cloſeſt to his diurnal Rotation, and ſo makes the longeſt Stay at one Time above his Horizon: Hence the Sun's daily Motion will alſo appear much ſwifter than any of his Moons.

For by every periodical Revolution of each of his Moons, whether longer or ſhorter, they loſe a daily apparent Revolution of the Sun; ſo that the firſt performs but 3 apparent Revolutions about *Jupiter* while the Sun performs a little more than 4. or is obſerv'd to riſe and ſet 4 Times before his firſt Satellite has done 3. The ſecond performs ſeven and an half apparent Revolutions, while the Sun performs eight and an half. And ſo the third performs about 16 while the Sun does 17. And the outermoſt 40 while the Sun performs 41 apparent Revolutions.

Thus our Moon, between Change and Change performs one apparent Revolution leſs than the Sun.

§. 9. Now

§. 9. Now from hence, the curious Inhabitants of *Jupiter*, may, from theſe Obſervations, as well as we, determine, that it muſt be *Jupiter*'s Rotation upon his own Axis, (as we do that it is the Earth's) that cauſes theſe different apparent Motions; and conclude, that, contrary to theſe Appearances, the neareſt Body to him muſt naturally have the quickeſt Motion round him; becauſe more diſtant Globes have the larger Circuits, and therefore in the Courſe of Nature, take the more Time to perform them in, which Law we find exactly obſerved in all the Motions of the Globes whereof we can make any Obſervations, and which plainly appears to us in this Syſtem of *Jupiter* and his Satellites, which thro' the Syſtem, maintain'd by *Copernicus*, anſwers in all Caſes.

So that *Jupiter*'s Inhabitants, *&c.* will find Evidence for Conviction, that theſe Motions are performed contrary to common Appearances, from finding the moſt diſtant Globes they are acquainted with performing their apparent Revolutions the ſwifteſt, contrary to Nature's eſtabliſhed Maxims; from whence they may more than probably conclude, that tho' it be ſo to common Appearances, yet it is not ſo in Reality, and ſo be brought to allow the diurnal Rotation of their own Globe, as we are at laſt almoſt fully perſwaded to do concerning this of ours.

§. 10. I have before obſerved that the complicated Forces of *Jupiter*'s Moons are concerned to purge and cleanſe his Seas by raiſing their Tides, and as his Body is ſo vaſtly large it had need of ſuch complicated Forces for that Purpoſe, and is in that Caſe therefore as well provided for by the alwiſe Creator.

§. 11. Now, the nightly Illuminations, which his Moons afford him, are more than doubly return'd by him to them. His firſt will almoſt receive as much Illumination to her Hemiſphere towards him as from the Sun himſelf; for what a mighty Globe muſt he appear to his neareſt Moon, when ſhe is at Change to him, and has her darkened Hemiſphere towards him, for tho' ſhe then comes to caſt her Shade in his Face, yet that will be ſo ſmall an Obſtruction to his Return of reflected Light, that it will only appear as a ſmall Speck therein; and will then appear to this his neareſt Satellite's Inhabitants, that have *Jupiter* near their Zenith; to overſpread, perhaps, ¼ of his Hemiſphere, and from his Magnitude and Vicinity will give that reflected Light, that will nearly equal that of the Sun's; what then muſt the Inhabitants thereof imagine of *Jupiter*, when his Body, like a large fiery Cloud lights them a-Nights as the Sun does a-Days.

§. 12. But

§. 12. But whether this Satellite, or any of the reſt, have their diurnal Rotations contrary to, or commenſurate with their periodical Revolutions, I cannot find has been yet diſcovered, we being too remote to diſcover this by Obſervations of his Moons. But if his Moons, as I think it is moſt probable, like ours, have only a diurnal Rotation proportionate to their periodical Revolutions; then one Hemiſphere only of *Jupiter*'s Moons can only enjoy the Benefits of his Illuminations in the Abſence of the Sun: But by their Revolutions amongſt themſelves, they will enjoy the Convenience of Illuminations from one another, on their other Hemiſpheres in their various Motions and Paſſages by one another; and alſo by the ſame Motions have their Tides raiſed and their Seas purged.

And as we find in all the Almighty's Works a certain Conformity, ſo we may reaſonably judge of the ſecondary Attendants of the primary ſuperior Planets, that they, as our Moon, have their diurnal Rotations commenſurate with their Periods of Revolutions, and which for ſeveral Reaſons, hereafter conſidered, may be moſt wiſely adapted.

If by their diurnal Rotations they ſhould turn their different Hemiſpheres towards the Body of their primary Planet, his much ſuperior Bulk and ſtronger Attraction would make ſuch violent Diſturbances upon their Seas, as would render them incommodious, troubleſome,

ſome, and dangerous to their Inhabitants: whereas by *Jupiter*'s and the Earth's always reſpecting only one Hemiſphere of their Moons, whatever Attraction they have upon them it is without Change of Parts thro' different Poſitions, and ſo no contrary Perturbations of Exceſſes can ariſe from thence.

But, in this Caſe, all *Jupiter*'s Moons will enjoy their mutual Benefits in each Hemiſphere both to excite their Tides, as far as is neceſſary, by their Changes of Poſitions, and to illuminate each other's Nights in that Hemiſphere to which *Jupiter* is always inviſible, and alſo to add to his Illumination in the other, when *Jupiter*'s Overballance of Light does not dazzle their fainter Endeavours, and render them that way uſeleſs, yet even then, by making their proper Appearances, they may alſo have other proper Uſes and Services to one another.

The only Diſadvantage then that can ariſe from their having no other diurnal Rotation than what is commenſurate with their periodical Revolutions, is, that one of their Hemiſpheres can never come into the View of their primary Planet, and which is the very Caſe with our Moon; and I therefore defered the Conſideration of that, that I might here conſider them together; and as the ſame Reaſon will hold good for the one as the other, ſo the ſame Reaſons, why ſuch Reſpect of the ſecondary to the primary Planets is moſt wiſely ordered,

will

will alſo account for *Saturn*'s Secondaries obſerving the ſame Laws.

And now beſides the Reaſon, above obſerved, in the Inconveniences of Tides, let us ſuppoſe,

That the Inhabitants of theſe ſecondary Planets are devoted to Trade, Travel, and Induſtry, and that their Globes are made up of like Matters as ours is, and furniſhed with Mines of Gold and Silver, or Minerals of the like Value amongſt them, and that their richeſt Mines are found in thoſe Hemiſpheres, that never enjoy the Sight of their primary Planet.

Now the Inhabitants of the Hemiſphere of theſe Moons, thus deſtitute of the Sight of their primary Planet, hearing that in ſuch other Parts of their World, there was to be ſeen frequently a-Nights ſuch an amazing Wonder, may be thereby excited, as well for Curioſity as Profit, to make Voyages into thoſe Parts, and to take with them their Gold and Silver, or valuable Subſtance to exchange for ſuch Commodities, which the Inhabitants of the other Hemiſphere were more particularly poſſeſſed of, who enjoy this admirable Curioſity, for the Sake of ſeeing which, they are the more forcibly drawn to engage in this Undertaking, ſo that if it were not for theſe Exchanges, the one might want the Riches, and the other the Commodities neceſſary for each to be ſupplied with: For as the one is rich in Gold and Silver, (or let it be what it will of a like Value)

lue) and the other in uſeful Neceſſaries of Life, and as an uſeful Traffick is neceſſary between them; ſo, not only the Advantages thereof will excite them to it, but alſo the one is thereto invited by a ſtrong Deſire to ſatisfy his Longings after ſo pleaſing a Curioſity, which he has been informed of, and the others are invited to make Voyages thither for their beneficial Riches; and each are excited back to enjoy the Benefits they were firſt indulged with, and both remain ſatisfied with the communicable Returns of the one from the other.

What I propoſe by this Hypotheſis is, to ſhew, that it is poſſible, even, for Man to imagine how ſuch an Order, which we particularly find in our Moon, and which is probably in all Secondaries to their primary Planets, may have Advantages, which may certainly render that Order better eſtabliſhed, and much ſuperior to what it could have been in a contrary Adjuſtment: And from this I may reaſonably infer, that as it is poſſible for Man, at an imaginary View, to diſcover which Way ſuch Order was better adjuſted than if it had been otherwiſe, ſo we may aſſure ourſelves that infinite Wiſdom has eſtabliſhed the Varieties of the Works of his Hands in all habitable Globes in ſuch Order and Harmony as will beſt ſuit the Occaſions and Situations of ſuch of their reſpective Inhabitants.

Of

Of the Eclipſes of JUPITER *and his* SATELLITES.

§. 13. Now by the periodical Revolutions of *Jupiter*'s Moons, their frequent Changes and Paſſages by *Jupiter*'s Body, and by his Interpoſitions between them and the Sun at their Fulls, Eclipſes of each will happen, when their Latitudes carry them not out of one another's Shades; and the Latitudes of *Jupiter*'s 1ſt, 2d, and 3d Satellites are never ſo great as to carry them out of his Shade at their Fulls, as Dr. *Derham* has diligently obſerved, though, he ſays, his 3d Satellite has in her Latitude advanced near to, if not even with the very Limb or Pole of *Jupiter*, and that her Stay in *Jupiter*'s Shadow, or the Duration of her Eclipſe at that Time, was leſs than what was commonly aſſigned unto it, becauſe that Satellite had only the Outſide of the Cone of *Jupiter*'s Shadow, and conſequently a leſſer Part to paſs through at that Time.

But in the Satellites Paſſages between the Sun and *Jupiter*, their Bodies being vaſtly leſs will only caſt a ſmall Shade, which may be ſeen to paſs over his Face, while the Inhabitants of that Tract in *Jupiter* will behold a partial or total Eclipſe of the Sun for a very ſhort Time.

The Eclipſes of the Satellites, amongſt one another, happen as their Directions occaſion them,

them, in their periodical Revolutions, and are ſome of them ſometimes total and ſometimes partial, according to their Latitudes and Directions.

But at their particular Fulls *Jupiter* paſſes between the Sun and them, and will for a conſiderable Time totally eclipſe the Sun from them, till their Revolutions which brought them into his gloomy Shade, ſhall carry them out of it, and while he eclipſes the Sun to them, he alſo eclipſes them to himſelf; and when this happens to the firſt, during the Eclipſe of the Sun, ſhe may enjoy the Benefits of the ſecondary Lights of ſome or all of her three concomitant Moons according to their then Poſitions to her, ſo the ſecond chiefly of the outermoſt two, and the third chiefly of the fourth: But the fourth, except the other three are advantagiouſly placed, as, in, or near their Quadratures from Change or Full, ſhe will enjoy no Advantage from them in her total Eclipſe, but then ſuch Eclipſes happen leſs and more ſeldom to her than any of the reſt, and in theſe Eclipſes ſhe is alſo totally or partially eclipſed to *Jupiter*, and all her concomitant Moons as far as viſible to them; for when any of *Jupiter*'s Moons ſuffer Eclipſes of the Sun, three of which are every Change total, they will ever appear totally eclipſed themſelves to both their primary and concomitant Planets.

Now

Now theſe Eclipſes in this Syſtem, which almoſt appears as a Syſtem by itſelf) have their ſeveral Uſes, Services, and Advantages one to another; and even to us, at this Diſtance, they alſo become advantageous, being helpful to us, from the true Calculations of their Motions, to aſcertain, or at leaſt to correct the Accounts of our Longitude at Land; and therefore we may readily ſuppoſe that their Calculations there being aſcertained, that their Longitudes and Latitude in all theſe Globes may be aſcertained to one another amongſt the whole of their Syſtem, both by Sea and Land; and they may alſo be of other valuable Uſes to each other, that here we cannot pretend to gueſs at, if we would imagine their Inhabitants only of the ſame or like Reaſon and Faculties with ourſelves.

Of JUPITER'S BELTS.

§ 14. What I ſhall obſerve of *Jupiter*'s Belts, I ſhall take the Liberty to tranſcribe from Dr. *Derham*, as he has done from the learned, ingenious and induſtrious Monſ. *Caſſini*.

'These Belts, ſays Dr. *Derham*, Monſ. *Caſſini* (who longer viewed this Planet than any body elſe) takes to be Canals containing ſome fluid Matter or Water, that more weakly reflects the Sun's Rays than the other Parts of the Planet do, and that they have ſome Reſemblance with what happens here upon Earth. For, ſays he, (M. *Caſ.*) if one from

on

'on high, in the Heavens, ſhould ſee the Earth 'in ſome particular Situations,* the Sea, which 'encompaſſeth the Earth would appear very 'like the great Southern *Belt*, that encompaſ-'ſeth the whole Globe of *Jupiter*; the *Mediter-'ranean* Sea would make an Appearance, not 'unlike thoſe *Belts*, which are interrupted and 'broken, which we ſee in this Planet: The 'other Seas would make thoſe great black 'Spots, which never alter at all: The Conti-'nents and Iſles would ſeem like thoſe bright 'Spots that are ſo permanent. The Snows 'would make thoſe glittering Sparkles (*Bril-'liants*) that from Time to Time diſappear: 'The Flux and Reflux of the Ocean, and 'thoſe great Inundations that happen ſome-'times here, would occaſion other Spots to ap-'pear and diſappear: The Moon would re-'ſemble one of *Jupiter*'s Satellites: In fine, the 'Clouds of our Atmoſphere would reſemble 'thoſe broken interrupted Belts, and thoſe 'tranſitory Spots, which often change their 'Size and Figure, and have Motions of diffe-'rent Velocities. Thus that ingenious and cu-'rious Obſerver, according to whoſe not im-'probable Opinion, this Planet *Jupiter* hath 'all his Parts orderly placed, as is here upon 'Earth.'

COROLLARY.

And now, May we not juſtly fall into the humbleſt Adoration and the deepeſt Aſtoniſh-ment

* As at *Venus* or *Mercury*, nearer the Sun.

ment, to find, in all theſe Traces, the Footſteps of infinite Power, Wiſdom, and Goodneſs, which have eſtabliſhed the ſame Laws of Order to be obſerved in all Globes ſo far diſtant from each other, and in rendering each ſo uſeful to one another? Does not this plainly demonſtrate, that they are all the Works of one Almighty and unerring Power, even the infinite Power and Wiſdom of one Omnipotent Creator, who has fixed one Order thro' the whole Oeconomy, and has preſcribed to each ſuch reciprocal Laws, which they ſeem joyfully, faithfully and conſtantly to obſerve without Tranſgreſſion? And is not the Eſtabliſhment of their due and proper Diſtances from each other, obſerved both amongſt the primary and ſecondary Planets, with the Aſſignment of their Orbits, not to claſh or interfere by croſſing each other, an indiſputable Manifeſtation of the unerring Wiſdom and infinite Power of God in all his Works, as well as a plain and inconteſtible Proof of his real Being and Exiſtence?

CHAP. XIV.

Of SATURN.

§. 1. *SATURN*'s Orbit is near as far beyond *Jupiter*'s, as *Jupiter*'s is from the Earth's; notwithſtanding an amazing Proviſion has been diſcovered, by the Help of good Glaſſes, to be made for him, to anſwer his want

want of Proximity to the Sun, to whom alſo he pays his Tribute of Gravitation, (from the very ſame Reaſons, before proved, that *Jupiter* does) and reſpects him as his Center, and even at ſo vaſt a Diſtance as near 700 Millions of Miles, (as Dr. *Derham* has computed it) is alſo furniſhed with Light and Heat therefrom, ſo that we may again conclude that his Atmoſphere is alſo adjuſted to his Diſtance for the Entertainment of the Sun's Light and Heat, as obſerved in my View of *Jupiter* and the reſt.

§. 2. For as his Diſtance is ſo much further than *Jupiter*'s ſo is his Proviſion the more, there being not only diſcover'd five Moons to attend him, but alſo an amazing Ring encompaſſing his mighty Globe, which appears to be deſigned by the alwiſe Creator, as an additional Supply to *Saturn* to collect and reflect to him, and moſt probably to his Moons, a more powerful Heat and ſtronger Light; ſo that by the Advantages of his Ring, with the Aptitude of his Atmoſphere, he may enjoy as great Portions of the Light and Heat of the Sun as we, or any of the Globes of our Syſtem do.

The Appearance of this Ring is ſingular to *Saturn* only, and as it has been obſerv'd by Dr. *Derham*, who beſtowed much Labour and Pains in enquiring into the Curioſities of it, I ſhall take the Liberty to tranſcribe his Obſervations of it from his Aſtro-Theology.

Con-

'Concerning *Saturn*'s Ring, ſays he, theſe 'Things are obſervable, *Firſt*, the prodigious 'Size of it, its great Breadth, and vaſt Com-'paſs; this we may make a Judgment of by 'comparing it with *Saturn* himſelf. And ſup-'poſing *Saturn* to be in Diameter, as com-'puted, 93,451 *Engliſh* Miles, the Diameter 'of his Ring will be 210,265 ſuch Miles, and 'its Breadth about 29,200. An amazing Arch 'to an Eye placed in that Planet.

'*Secondly*, The due and convenient Diſtance 'of *Saturn* himſelf, not too cloſely adhering to 'it, becauſe that would annoy a large Portion 'of *Saturn*'s Globe, by depriving it of the Sun's 'Rays; by invironing it about the Diſtance of 'its Breadth, the Sun's Rays are permitted to 'enter between the Planet and the Ring, while 'other Rays are, at the ſame Time, reflected 'upon the Planet by the Ring.

'*Thirdly*, The Thickneſs of the Ring, which 'is hardly, if at all, perceivable by us; which 'is as great a Benefit, as its edging Shade would 'be an Annoyance, was the Ring thick.

'*Fourthly*, Its Smoothneſs and Aptitude to 'reflect Light and Heat is a wonderful Conve-'nience in it. Was it full of Mountains and 'Valleys, and I may add Waters too, as in our 'Earth, *&c.* the Reflections would be too weak 'to render the Ring viſible to us at ſo great a 'Diſtance as we are, but perceiving its Light 'to be ſo lively and ſtrong, as to render both 'its ſelf, and *Saturn* very illuſtrious, it is a

'Demonſtration of the Aptitude of its Structure, and Smoothneſs for the Reflection of 'Light and Heat to the Planet it ſerves.

'*Fifthly*, As the Periodical Revolutions of 'the Earth, are an excellent and providential 'Contrivance for thoſe uſeful and neceſſary 'Mutations we have of the Seaſons of the Year, 'ſo no doubt but the ſame Benefits accrue to 'thoſe Revolutions, which *Saturn* hath about 'the Sun. It is viſible that *Saturn* changeth 'his Place in his Orbit, ſo his Ring receives a 'variety of Aſpects, not only with Reſpect to 'us, but to the Sun. Thus in one Part of his 'Orbit, his Ring appears with a large Eliplis, 'ſo as to exhibit a large Space between it and '*Saturn*. In another Part, with a leſſer, and 'ſo with a leſſer Eliplis; and ſometimes as 'only a ſlender ſtraight Line; and ſometimes 'it is not viſible at all: Alſo ſometimes one Side 'of the Ring is enlightened and reflects Light 'to one Part of *Saturn*, ſometimes the other 'enlightens another Part; and there is no doubt 'but that as our Earth has its Seaſons, ac'cording to its Change of Poſitions to the Sun 'in its periodical Motion in its Orbit; ſo *Saturn*, 'throughout his Period, hath his Seaſons ac'cording to his Poſition to the Sun, and the 'various Reflections of the Ring upon the ſe'veral Parts of his Globe.

'Theſe five Things obſervable in *Saturn*'s 'Ring, (continues he) we have pretty good Aſſu-

'Assurance of, from our Views thro' good 'Glasses. But then

'*Sixthly*, I shall add as only conjectural, 'that the Axis of *Saturn* is inclined (and that 'pretty much also to the Plane of his Ring, or 'the Plane of his Orbit at least; and that he 'has a diurnal Rotation in some certain short 'Space of Time; for without these two Con-'veniencies very large Tracts of *Saturn* would 'suffer extremely for Want of the Sun. For 'if *Saturn* hath no other Motion but that round 'the Sun in its Orb, one Part must be excluded 'from the Sun's Visits for 15 Years, while the 'other partakes all the while of them; and one 'Hemisphere will enjoy the Benefits of his 'Ring, while the other is eclipsed by it: And 'in this Case the Ring would be nearly as pre-'judicial to the eclipsed Part as it is useful to 'the enlightened: But supposing *Saturn* to 'move round in the same, or a shorter Time 'than *Jupiter*, and in a Path pretty much in-'clined to the Ring, all Parts then of that vast 'Planet will have their frequent Returns of 'Day and Night, of Heat and Cold. And 'since this is what is discernable in the other 'Planets, and is no less necessary for the Be-'nefit and Comfort of this, we may reasonably 'conclude the Thing to be probable altho' not 'discernable at *Saturn*'s great Distance from 'us.' Thus far that laborious Observer of the Heavenly Bodies.

From this Deſcription it appears that this Ring, in two oppoſite Points comes very near to *Saturn*'s Body; and the other Parts run out with oppoſite large Arches, and appear ſo to us when in proper Situations of his Orbit, which being always found to make its different Appearances according to *Saturn*'s different Places in his Orbit, makes it plain that the Ring moves not with *Saturn*'s diurnal Rotation, but only accompanies him in his periodical Revolution, and that *Saturn* turns upon his own Axis within the Ring; ſo that the Ring by this eliptical Figure, by *Saturn*'s diurnal Rotations will appear to his Inhabitants to turn round and become nearer to, and further from every Part of his Body in every of his diurnal Rotations, which Change of Poſitions may be as neceſſary to the Inhabitants as the Sun's, and other Luminaries Riſings and Settings are.

Of SATURN's SATELLITES.

§. 3. Now as to *Saturn*'s five Satellites, what I have obſerved concerning *Jupiter*'s four, as theſe of *Saturn*'s are in moſt Reſpects conſentaneous, I ſhall not think it needful to make ſuch Remarks as would appear Repetitions of ſimilar Circumſtances; I ſhall therefore only obſerve ſome Things peculiar to this Syſtem; as firſt,

That his outermoſt Satellite is obſerved to be more diſtant from the fourth than the common

Diſtances

Diſtances of his others, and of thoſe obſervable in *Jupiter*'s; which being out of the Way obſerved amongſt the reſt of theſe Secondaries, ſome have imagined that according to the Space, there might be another between the fourth and outermoſt.

But this Space between the fourth and outermoſt ſomewhat reſembles the much greater Diſtances between *Jupiter* and *Mars* than any other Planets have, which are within their Orbits, and the ſtill much greater Diſtance between *Jupiter* and *Saturn*, the outermoſt of all the primary ones; which Diſtances being neceſſary becauſe of the Orbs of ſo many Moons attending them, that their Revolutions might be free and uninterrupted; from theſe Conſiderations, I am induced to ſuppoſe, that if there be any other Moon in the Caſe of this Diſtance, that it is an Attendant to this outermoſt its ſelf, and therefore ſo ſmall, as not by any Means, we are yet acquainted with to become viſible to us.

And this alſo would render *Saturn*'s Syſtem the more complete and make it appear to his Inhabitants, as in great Probability it does, the only complete Solar Syſtem, with his primary Planets about him, and to his outermoſt a ſecondary Attendant allowed. But more of this hereafter.

Dr. *Derham* alſo obſerves, and confirms his own Obſervations with Mr. *Huygens*, that the outermoſt Satellite of *Saturn* never appears vi-

ſible or luminous but on the Weſt Side of *Saturn*, and tells us from thence that Mr. *Hugyens* concludes that this Satellite always reſpects *Saturn* with the ſame Face, having (as I have before conjectured of all Secondaries) its diurnal Rotation commenſurate with its periodical Revolution; and ſuppoſing that this moſt remote Satellite has only one Part of his Surface clear and the other, and greateſt Part, obſcure (or perhaps much overſpread with Waters) then all the while the obſcure Part is towards us, which is while this Satellite is on the eaſtern Part of its Orbit, it diſappears or reflects not Light ſufficient to be here obſerved; but on the weſtern Side it appears, having that Side towards us that is leaſt obſcure.

§. 4. As *Jupiter*'s Satellites are computed, all or moſt of them, to be as big, or bigger than the Earth, ſo *Saturn*'s are ſuppoſed to be bigger than *Jupiter*'s; though Dr. *Derham* owned he could never get a View of *Saturn*'s two neareſt, but was obliged to content himſelf with the Accounts he received of them from other Obſervators.

§. 5. Now let us conſider how Things will appear to an Eye at *Saturn*, and think how we ſhould form a Judgment of the Works of Creation, ſuppoſing ourſelves there in the ſame Capacities only, which we are here endued with.

And

And here the Sun and Ring are the firſt Things obſervable in the Day Time; The Sun appears to whirl round with a prodigious Velocity, and affords a comfortable Heat, and a Ring environs the Hemiſphere like a great and ſpacious Arch, and comfortably ſtrengthens the Light and Heat of the Sun.

When the Night comes, here is the Preſence of more or leſs Moons; which, from their various Motions, give more Light to that Planet a-Nights, than all the Planets of the whole Syſtem do us, nay ten Times more, if we except our one Moon. And here the Sun and theſe five Moons make them ſix Planets, and if his outermoſt Moon has an Attendant, ſeven, if there be no more; ſo that he appears a more complete Syſtem, in one Reſpect, to the Inhabitants of *Saturn*, than what has been formerly imagined here of the Whole: For here his Moons may be looked upon as a Syſtem of Planets revolving round him, and thro' their different Motions making various Aſpects amongſt one another, from whom alſo they receive comfortable Illuminations a-Nights, with all the Offices, before obſerved of Appointment of Secondaries to their Primaries; ſo that ſhould we ſuppoſe them ignorant of all other Globes of the Solar Syſtem, yet their own appears completely furniſhed and mutually provided for.

And indeed it muſt be impoſſible for the Inhabitants of *Saturn*, or thoſe in his Moons

to diſcover any other Globes but the Sun, one another, and the fixed Stars, except ſometimes *Jupiter*, and that only, at proper Poſitions, as a Morning and Evening Star; and then the Proviſion which *Saturn* has of nightly Illuminations from his Moons may ſo over-dazzle *Jupiter*'s fainter Light, that he may probably be either looked upon as a common Fixed Star, or, by ſome curious Enquirers, who may obſerve the certain Periods of his Appearances, deviating from them, be judged of, as we do of new Stars or Comets; from whence ſeveral and various Conjectures may be made concerning it, and which we have the greater Reaſon to ſuppoſe, becauſe a favourable Opportunity of making ſuch Obſervations but ſeldom happen.

Yet if theſe Periods of its becoming viſible Morning or Evening, ſhould by any of the Curious be truly calculated, from repeated Obſervations, they will not be likely to come at the Knowledge, that *Jupiter* is a Globe like their own, and confined to an Orbit nearer the Sun: But if perhaps there ſhould be any ſo curious and inquiſitive to diſcover this by Obſervations of his Moons by Glaſſes, or optical Inſtruments, yet it is moſt probable that few would be found that would embrace, but many that would condemn their Sentiments, and would ſooner believe that their Globe is the immoveable Center of the World, and that the Sun, their Moons, or Planets, with the Fixed

Stars

Stars had their Times of Riſing and Setting merely from their own Motions, and alſo thereby performed all their Offices requiſite for their Uſes and Benefits only. Though all this is plain to us on this Globe to be performed through his own diurnal Rotation, and the reſt of his and their own Motions. And the Inhabitants of every one of his Moons lie under the ſame Diſadvantages of diſcerning between true and real Motions and Appearances.

§. 6. From the Diſtances of *Saturn*, and his Moons, to us, it may be by ſome imagined, that he being placed with his benighted Hemiſphere nearer the Fixed Stars than we, he may therefore receive a more ſplendid Luſtre from them: But if we conſider the immenſe Diſtances of the Fixed Stars beyond this Syſtem, as has been before conſidered, we ſhall have Reaſon to believe, that if we were there, we ſhould not be able to diſcover any perceivable Difference of their Appearances there to what we behold here; for if their Magnitudes here, becauſe of their immenſe Diſtances, are not capable to be augmented to our View by the Help of the beſt Glaſſes, as they really are not, then the Diſtance of *Saturn* from us will ſink into a mere Point in Compariſon of the Diſtances of the Fixed Stars.

The

The CONCLUSION *of the fourth Day's Work.*

Thus I have taken a View of the neceſſary Proviſion of thoſe two abſolutely neceſſary Comforts and Supports to the whole material Creation; *viz.* Light and Heat, deducible from Sun, Moon and Stars, that, upon this fourth Day of Creation, were made capable of becoming viſible to each other; in which, what an ample Scene of unerring Wiſdom, and immeaſureable Power, and infinite Goodneſs muſt here appear thro' the whole; when, even, all the Globes of our whole Syſtem, not only lie under the ſame Neceſſities for the ſame Proviſions of Light and Heat, but the ſame Proviſions are accordingly afforded to all; and as far as is poſſible in the ordinary Courſe of Nature made ſerviceable to each other? We actually ſee and feel the Effects of theſe indulgent Proviſions, and enjoy and behold the powerful Acts of our indulgent Creator's Care; even for innumerable Globes and Inhabitants, we may very reaſonably conclude, as well as ours, and the Syſtem to which we belong.

But if we go no further than this our Solar Syſtem, what a glorious View are we here let into, even by that enlivening Maſs of Fire, placed in the Center of it, that not only gives Life and Vigour to all the Globes belonging to it, by diſtributing his Rays, not only to warm and invigorate us, but alſo to diſperſe that Darkneſs

Darkneſs, that would deprive us of the comfortable Views of the whole material Creation?

And in his Abſence behold the Proviſions for the Nights, in multitudes of Stars, and to us a Moon; and other Globes, Pluralities of them, to attend and aſſiſt each in the Nights, and to be for Signs and for Seaſons, and for Days and for Years: Who can take the leaſt View of theſe Things, and not have their ardent Love and Amazement excited to the Author of them? When all theſe Works are ſo admirably contrived, ſo wonderfully, and ſo providentially ſuited to anſwer every good, wiſe, and neceſſary Purpoſe thro' every individual Branch, that a perpetual Chain of Harmony appears thro' the whole viſible Creation. Who can partake of the beneficial Products of theſe wonderful Works of Goodneſs ſprung from the great Creator's providential Care, and not acknowledge and adore him, and break forth into the moſt celebrated Praiſes of ſo admirable a Contriver, and beneficient a Creator of them?

I do not at all think it neceſſary from hence to pretend to prove the Being and Exiſtence of a God; becauſe to offer that, I think, would be an Affront to any intelligent Creature, ſince every intelligent Creature muſt neceſſarily be convinced of that, who gives himſelf the leaſt Liberty to think; ſince he cannot in the leaſt Works of the Almighty but plainly ſee, a ſuperior Power exerciſed therein, above the Reach of all poſſible humane Inventions. But I would

hence

hence infer once more; that as the inanimate Bodies of the Univerſe were purpoſely created for the Uſe and Benefit of the Intelligent, Let the conſtant Conformity of the inanimate Globes to the eſtabliſhed Laws of their Creator, learn us intelligent Agents not to deviate from the juſt Laws which he has preſcribed both for our preſent and future Welfare, but in the beſt Obedience we are capable of performing, let us glorify and praiſe Him here, that we may be made happy in him hereafter, *Amen.*

CHAP. XV.

Of the Animal CREATION.

VERSES 20, 21, 22, *and* 23.

AND God ſaid, Let the Waters bring forth abundantly the moving Creature that hath Life, and Fowl that may fly above the Earth, in the open Firmament of Heaven.

And God created great Whales, and every living Creature that moveth, which the Waters brought forth abundantly after their Kind, and every winged Fowl after his Kind: And God ſaw that it was Good.

And God bleſſed them, ſaying, be fruitful and multiply, and fill the Waters in the Seas; and let Fowl multiply in the Earth. And the Evening and the Morning were the Fifth Day.

§. 1. God

§. 1. God having in the former Days Work made a Proviſion of Light and Heat, as well for the Entertainment and comfortable Subſiſtance of living Animals, when produced, as for the helping forward the very Production of them: He now proceeds to give the Almighty FIAT, *Let the Waters bring forth abundantly the moving Creature that hath Life*, &c.

In the former Days Works, the Air, by gradual Proceſſes became free from the Obſtructions of opake and earthy Particles, and the Sky became ſerene, when the benign Rays and kindly Influence of the Sun were admitted to the Surface of the Earth, and into the Collections of the Waters, the Seas; which were alſo now become refined, and bounded, in their own eſſential Property; ſo that they were now ready for the Product of the Almighty's Command; being by Him, before prepared with a Pregnancy of vaſt Varieties of Seminal Productions of Inhabitants proper to their own Element.

And, I think, it is moſt reaſonable to believe, that they and all other Animals, upon their firſt Creation, were created no more than one Male, and one Female of every Species, for God's firſt Command to them, after their Creation, was, *Be fruitful and multiply.* Now this Act of Creation of ſuch vaſt Varieties of different Kinds is implyed in the Command, *Let the Waters bring forth abundantly*, that is, Let them bring forth Abundance of different Kinds of moving Creatures, that ſhall continue their Habitations there,

there, with Powers of Self-motions: And their having ſtrong Inclinations given them to the Propagations of their ſeveral Species, ſeems to be the very Command they are ſaid to receive, *Be fruitful and multiply*: And their free Powers added to their Inclinations was the Means of their Obedience, which they have not deviated from, but have faithfully obſerved, as well as the material inanimate Parts of the Creation do always perſevere in their eſtabliſhed Laws.

Now this Act of God's Creation of living Animals in the Waters we can only look upon as an Exerciſe of incomprehenſible Power and Wiſdom in a myſterious Modification of certain Portions of Earth and Water in their Attempts, perhaps, to ſeparate their eſſential Properties, when by the kindly Warmth of the Sun, and directing Power of God they join, unite, and form ſuch porous Tubes, and harmonious Chains of Net-work, which is paſt all Power and Wiſdom leſs than Infinite to deſcribe, conceive or comprehend how the Faculties of Perception, Action, and Self-motion ſhould thus be entertained in mere inactive paſſive Matter: And alſo how they ſhould in their Make, Shape, and proper Diſpoſals of their various Members be every Way proportioned to anſwer, each one, their ſeveral and different Occaſions and Neceſſities.

A Thing ſo wonderfully adjuſted in every individual of the whole Creation, that though many

many have particularized themſelves to ſearch into the Myſtery of this Part of the Creation; yet the greateſt Proficients in theſe Curioſities have always been found the greateſt Admirers, and their greateſt Penetration into this Secret was, that they found it inconceivably great and glorious, and what adminiſtred Matter of Wonder ſufficient to raiſe in them that Awe and Adoration of the ſupreme infinite Creator, as to acknowledge theſe Things to be the Product only of his divine Wiſdom and Power; and which indeed is alſo diſcoverable in all his Works.

Now alſo the Earth and Air, by the ſame Admiſſion of the Sun, became capable of the Production of winged Fowls, which we may ſuppoſe were impregnated in the Embrio of the finer Parts of the four Elements curiouſly intermixed and interwoven; and, by an infinite and divine Art, ſo modified and prepared, that the Sun, as a ſecondary Inſtrument, ready to warm and invigorate the heaving Maſs with vital Heat, thereby adds Life, Perception, and Self-motion, to bring forth ſuch vaſt Varieties of Fowls of the Air, to enjoy the Benefits of thoſe Proviſions, that he had prepared for their comfortable Food and Subſiſtance, having the Day before ſent the Sun to enlighten, warm, and invigorate the Earth, with the Fruits and Vegetables thereof, *&c.* to make all Things ready for the Entertainment of this Tribe of Animals, who were ſent,

as Harbingers, before to wait the Coming of their Lord and Governor MAN, and to attend upon, and welcome him at his Coming: And, no doubt, but the Advantages they would have been to Man in a pure Eſtate might have been vaſtly more than what we can now enjoy from them ſince their Subjection to Vanity by Man's Tranſgreſſion.

However we muſt now content ourſelves to view them in their, and our own preſent Circumſtances: And firſt, I ſhall take a ſhort Survey of the Aqueous Inhabitants in general, and from thence proceed to do the ſame of the winged and Airy Tribes.

Of FISHES.

§. 2. The Structures, and Shapes of all Kinds of the Aqueous Inhabitants are admirably adapted and adjuſted to their Element and State: Their Cloathings are either Scales or Shells, which are great Advantages to preſerve them from the Dangers they are there liable to, and moſt ſuitable to their watery Reſidence, and to the Motions they have to perform in Regard to the Affairs of Life: It is alſo obſerved by the Curious, that the Center of Gravity in them is always fixed in the fitteſt Place of their Body to keep it in a true Poiſe; and that the moſt ſwift are moſt commodiouſly ſhaped for making their Way in their natural Element, having every Part of their Bodies duly ballanced and accurately fixed

fixed to that Center of Gravity: By contracting or extending an Air-bladder, with which they are provided, they can either abide at the Bottom, or raiſe themſelves to the Top: By their Tails, which are moſt muſculous and ſtrong, they direct and haſten their Motion; that being ſays Dr *Derham*, the chief Part of active Motion in Fiſhes, as the pectoral Muſcles are in Birds and the Thighs in Man, *&c.*

§. 3. Amongſt theſe Watery Inhabitants are found Creatures of the largeſt Size, as the Text takes Notice, Ver. 21. *And God created great Whales*; whoſe Sizes no living Creatures beſides, either of the Waters or Land, ever came near. *Pliny*, ſays Dr. *Derham*, *Lib.* 32. *C.* 1. tells us of Whales 600 Feet long, and 360 broad, that came into a River of *Arabia*; And in the *Indian* Seas of Whales 960 Feet long.

And as the Waters contain theſe Creatures of the largeſt Sizes, ſo alſo are there others that inhabit them, the moſt minute; many Waters, eſpecially ſtanding Ponds, in *May*, and the Summer Months, being covered at the Top with prodigeous Numbers of ſmall Animals, which make green, yellow, or other coloured Scums upon their Surfaces, tho' one of them is inviſible to a naked Eye: Yet every one of theſe have the proper Organs of a Body to entertain common Senſation.

§. 4. The Eyes of the watery Inhabitants generally have their *Cornea* flat, that ſo denſe a Fluid might not be apt to annoy and offend it by their Movements thro' the Refraction of the Waters, which is different to that of Air; therefore, ſays Dr. *Derham*, has the wiſe Contriver of the Eye made the Chriſtaline ſpherical in Fiſhes, which, in Animals living in the Air, is lenticular and more flat.

§. 5. We cannot diſcover that the Inhabitants of the Waters are capable of communicating any Thing to one another by Way of Voice; and ſome have from thence concluded, that they have not the Senſe of Hearing; and others have imagined, that they do not take in and return the Air by Breathing; not indeed can they act in either of theſe Ways equivalent to Land-Animals; yet in a certain Proportion agreeable to their watery Element, they receive a certain Portion of airy Particles to take in and return, in a leſs Degree, ſuited to their leſs Occaſions; for if a Concourſe of airy Particles with the Waters be obſtructed, by Ice over Fiſh-Ponds, the Fiſh in thoſe Ponds will die for want of ſuch Intercourſe of the Air above with the Air in the Waters below: But Fiſh are preſerved in Ponds during hard Froſts by breaking Holes in the Ice, and putting Sheaves of Straw therein, with the Ends upwards

upwards and downwards to preſerve a Communication of the Air to them during the Froſt.

§. 6. The Proviſion for theſe numerous Inhabitants is wonderful, ſince ſuch vaſt Varieties of different Kinds live together, and the Large and moſt voracious make the Small their Prey; ſo that was not the Proportion of the Overballance of the more Fruitfulneſs of the Smaller than the Greater ſo adjuſted by Providence the Race of the Smaller would be ſoon extinct, and the Proviſion for the larger exhauſted. There is alſo a Proviſion made for many of theſe watery Inhabitants, by the Germination of many Aquatick Plants, as well as many Inſects, not only in the Waters themſelves, but alſo in the Air and Land, which chiefly delight to be about the Waters, and do thereby frequently become their Prey, and their Encreaſe and Multiplication is ſtill proportioned to their Uſefulneſs by exceeding their Decreaſe thro' others Voracioufneſs.

As I have but little Acquaintance however with theſe watery Inhabitants, I ſhall forbear to treat further concerning them, and refer the curious Enquirers after them to Dr. *Derham's Phiſico-Theology*, and proceed to take a ſhort View of the Birds of the Air.

CHAP. XVI.

Of Fowls.

§. 1. UPON the Creation of this noble Retinue of Animals to fly in the open Firmament of Heaven, began the audible Songs of Praiſe to the Great Creator, amongſt theſe winged Choriſters, who, with many different and harmonious Voices, make the Air eccho with their muſical Notes, who with charming concordant Strains, call upon one another to glorify and praiſe their bountiful Creator for that admirable and plentiful Proviſion which they found ready prepared, and ſuited to all the Occaſions in which they found themſelves concerned.

And theſe as the firſt in the Creation of living Animals in the open Air, were ſent as Harbingers, to make ready for the Reception and Congratulation of the Governor, deſigned to be ſet over them, which Office they joyfully accept and execute upon Man's firſt Appearance and taking Poſſeſſion of his Throne.

And now behold how gradually Man is provided for before his Coming; for the whole Globe with all the animate and inanimate Furniture thereof are not only deſigned for his Poſſeſſion, but to be made ſubject to him, and rendered every Way agreeable to ſuch Senſations which God deſigned to furniſh Man with

to

to render all these Provisions delightful and entertaining, as his Sensations of Seeing and Hearing, are adequately adapted to the Provisions of Light and Sound, and his other Senses as equally proportioned to their requisite Uses.

And Man coming thus qualified into the Possession and Government of this Fabrick, he, by the Provision of Light, adapted to his Sensation of Seeing, beholds the Glories of the heavenly Bodies, which administer vast and amazing Matters of pleasing Admiration; and when he casts an Eye upon the plentiful Provisions and necessary Furniture of the Globe, together with his Retinue of Attendance to wait his Reception, and beholds amongst them these beautiful Varieties of winged Servants, of a lower Degree of Reason and Intelligence than himself, and therefore finds them subjected to him, and by his Sensation of hearing observes their harmonious Voices, singing forth the Praises of their Great Creator, for their near Places under their Governor, who they rejoiced to be made subject to, under the plentiful Provision they saw made both for him and themselves.

Must not this excite their Governor Man, with an aditional Emulation, to signalize himself in Songs of Thanksgiving accompanied with as many superior Degrees of Pleasure, as his Capacity was in a superior Manner enlarged? which no doubt Man in his primitive State performed.

But here I cannot proceed without making an occaſional Breach upon my intended Diſcourſe by Way of Contemplation upon, and in Reference to, our relapſed State; wherein,

Oh! That Man would now, at leaſt, endeavour a Reſemblance of that Gratitude due to ſo benevolent a Creator; for whoever attains the neareſt to that primitive Thankfulneſs ariſing from a true Senſe of the Creator's Bounty, muſt neceſſarily be poſſeſſed of the greateſt Satisfaction and Pleaſure, as a Reſult of his feeling Indulgences, and the Returns of his Gratitude for them: For he, that can thus feelingly experience the Favours, and as gratefully acknowledge them, muſt have his Mind the moſt clear and ſerene; and may truſt that hereafter he ſhall be delivered from all ſuch Letts and Hinderances, as now diſturb and interrupt the Continuance of thoſe Joys, which he, upon theſe Occaſions, finds a Taſte of; and then, alſo, be made capable of performing thoſe Deſires and Wiſhes, which after theſe Taſtes he longs for a full Completion of, that he may even exceed his Primitive Injunctions and Duty, when releaſed from his preſent State, and then to continue and encreaſe his unſpeakable Joys, with Songs of Thankſgiving extracted from the Abundance of the Feeling Gratitude of the Heart, whereby, as it were, by his better Obedience in this State, than what he could have performed in his Primitive thro' the Merits of Chriſt, and the Grace of God abounding,

abounding, he may again attone for the early Diſobedience of the firſt of his humane Race, and ſo be made free from thoſe Fetters that the firſt Man's Diſobedience had intangled him in.

Who can ſee themſelves ſurrounded with the Glories of the heavenly Bodies, the Furniture of the Earth, and the plentiful Proviſions made for ourſelves, and every Animal, and not bleſs God, who made us ſo happy at firſt, and has alſo taken ſufficient Care to reſtore us, when we were deviated from our Primitive Purity, to a Capacity of riſing higher by the Fall? And that we may not live here too long in Sin and Miſery, he has appointed our Stay here to be but ſhort, that we may not fix our Minds too intently on the tranſitory Things of this Life, ſince our Diſobedience has here involved the whole Creation in Vanity, at leaſt as much of it as we are concerned in, ſo, to remedy this Inconvenience, God has rendered our preſent Lives and Eſtates very precarious and uncertain; but has amply ſhewed us, that all Uncertainties ſhall ceaſe in a future Exiſtence; and oh! that this would invite us to be always prepared to make our Appearance in that other State, wherein we ſhall have Joys without Sorrow, and Pleaſures beyond Expreſſion, to augment our Praiſes without ceaſing.

Amongſt theſe winged Choiriſters, I find, I have myſelf imperceptibly taken Wing and mounted above my common Reſidence, but muſt, like the Lark, in his aſpiring Flights, and warbling Notes, when his Strength can reach

no higher, close my extended Wings and drop from my Elevation, and be content to grovel awhile below again. And I shall next consider

The Make and Shape of Birds.

§. 2. The exquisite Art, wherewith this large Tribe of different Fowls are endued, and how they are proportioned and fitted for Flights, and the Celerities with which they perform their Motions, is amazingly wonderful, being a Gift past all Imitation, which can only be bestowed by no less a Power and Wisdom than that which is Infinite.

Thus to proportion the Make and Shape of their Bodies and so to adapt them as to raise themselves, and to make such Movements in the Firmament of Heaven, or open Air, and therein actively to make such swift Passages by a voluntary Self-motion, is what would be incredible to us, were it not for the Experience of ocular Demonstration; without which we should esteem such a Relation from a Traveller as a Romance, or at least question the Truth to the last, till repeated Relations should be made thereof by Men of unquestionable Veracity.

It is above the Art of human Philosophy to discover experimentally how this is effected: 'Tis easy to give a Philosophical Account of the Laws of the Hydrostaticks, as to Solids sinking or Swimming in the Waters, as their Substances

bear

bear more or leſs Gravities with a proportionate Quantity of the Waters they are put into; and that Solids lighter than their Bulk in Water will neceſſarily ſwim, and have ſuch a Proportion of their Bulks above the Water as they are lighter, and of leſs Gravity than the Water they ſwim in.

But the Element of the Air is ſo far from being a Fluid, that bears a Counterpoize with the Bodies of Fowls, as the Waters do with Fiſhes, that a Fowl bears near a proportional Weight, according to its Bulk and Size with other Animals, and their Feathers themſelves are not quite ſo light as the Air they fly in; for their moſt downy Feathers, being ſet at Liberty, fall downwards in the Air, inſtead of being buoy'd upward towards the exterior Parts of the Atmoſphere; but whatever is by Force borne down to the Bottom of the Water, that is lighter than the Water, being ſet at Liberty, will preſently aſcend to the Surface of it, and conſequently the ſame Law holds in the Fluid of the Air, wherein theſe Feathers, inſtead of being buoy'd upwards, will incline downwards till they reſt on the Surface of the Earth, tho' thro' their near equipoize with the Air, they may by a ſmall Current thereof, for ſome Time, dance upward and downward; and thus the fine downy Hairs of other Creatures will prove themſelves of as near an equipoize with the Air.

There

There muſt then be a Secret in the Art, given to this curious Tribe of winged Creatures, which remains to us unaccountable, which beſides their feathery Cloathing, enables them to perform their Flights, ſo as at Pleaſure to raiſe their Bodies into the open Air, and to throw themſelves into ſwifter Movements in it than any fourfooted Beaſts were ever capable of doing by the Movements of their Legs.

'Tis true Dr *Derham*, in his *Phiſico-Theology*, Book VII. C. 1. has very well attempted to account for this ſurprizing and admirable Art of the Flights of Birds; firſt from the Make and Shape of their Bodies, being ſharp before, to pierce and make Way thro' the Air, and by Gradations riſing to its Bulk; and I may add as gradually declining behind for the Air to puſh in upon the back Parts as their fore Parts force their Way thro'.

But then the very ſame may be ſaid concerning the Make and Shape of Fiſhes in the Waters to make their Ways thro' them; and that the Waters behind, cloſing after the Bulk, or middle of the Body, helps the Fiſh forward in its Movement, and give Eaſe and Agility thereto; which with the Strength of their Tails moving them this Way or that Way againſt the Waters on each Side, will, like Scullers to a Boat throw them forward, and likewiſe make them able to turn their Motions and Movements according to their Wills and Occaſions.

But

But there is no Analogy between the Fish in the Waters and the Fowls of the Air; for the Fish in the Waters are of a common Poize with their watery Element, and have only a Power to rise towards the Surface, by extending an Air-Bladder, given them for that Purpose, or, by contracting it, to descend towards the Bottom: And tho' in these are beheld the admirable Works of Wisdom and Power, yet those Motions of the Fish in the Waters are accounted for in as Philosophical a Way, as the aforesaid Laws of Hydrostaticks; allowing Life to this existent Matter in the Waters to influence it with Perception, Action, and Self-Motion.

But then the next Thing, that Dr. *Derham* observes, to facilitate their Flights, is, 'The 'neat Position of their Feathers, not ruffled nor 'discomposed, or placed some this, some a 'contrary Way, according to the Method of 'Chance, but all artificially placed for facili-'tating the Motion of the Body, and for that 'End, that most of the Feathers tend backwards, 'and are laid over one another in an exact 'regular Method, armed with warm and soft 'Down next the Body, and more strongly 'made, and curiously closed next the Air and 'Weather.' And next he takes Notice of a certain Oil Bag, from which, with their Bills, they squeeze out a certain unctious Matter, which they make Use of when they prune and dress their Feathers, so that when they are any

Ways

Ways disordered they put them to Rights again.

Then the Dr. goes on to the grand Instrument of Flights, the Wings, which he truly observes to be placed in the most commodious Point of the Body. 'To give it an exact Equipoise in that subtle Medium the Air. And 'here, says he, it is observable with what incomparable Curiosity every Feather is made; 'the Shaft exceeding strong, but hollow below 'for Strength and Lightness Sake; and above 'not much less strong, and filled with a Pith 'both strong and light too. The Vanes as 'nicely gauged on each Side as made; broad 'on one side and narrower on the other; both 'which incomparably administer to the progressive Motion of the Bird, as also to the 'Union and Closeness of the Wing.

'And no less exquisite is the Textrine Art 'of the Plumage also, which is so curiously 'wrought, and so artificially interwoven, that 'it cannot be view'd without Admiration, especially when the Eye is assisted with Glasses.

"And as curiously made, so no less curiously are the Feathers placed in the Wing, 'exactly according to their several Lengths 'and Strength: The Principals set for Stay 'and Strength, and these again well lined, 'faced, and guarded with the Covert and secondary Feathers, to keep the Air from passing thro', whereby the stronger Impulses 'are made thereupon.

And

'And laſtly, continues he, to ſay no more 'of this Part, that deſerves more to be ſaid of 'it, what an admirable Apparatus of Bones is 'there, but withal light and incomparably 'wrought? Of Joints which open, ſhut, and 'every Way move, according to the Occaſions 'of either extending it in Flights, or with-'drawing the Wing again to the Body? And 'of various Muſcles, amongſt which the *pec-'toral Muſcles* * deſerve eſpecial Remark, by 'Reaſon they are much ſtronger in Birds, than 'in Man, or any other Animal, not made for 'Flying.

'Next the Wings, continues Dr. *Derham*, the 'Tail is in Flight conſiderable, greatly aſſiſting 'in all Aſcents and Deſcents in the Air; as alſo 'ſerving to ſteady Flight, by keeping the Body 'upright

* Upon this Obſervation of the Doctor's, there is one Thing offers itſelf to my Thoughts, which, if it cou'd be proved, wou'd experimentally anſwer the Difficulty; and that is, ſuppoſing it cou'd be diſcover'd, that by the Aſſiſtance of theſe Pectoral Muſcles, they cou'd disburthen their Quills, Vanes of 'em, Feathers and Bones of ſuch Pervaſions of the heavier Elements than the Air, by a kind of Self-Inclination to perform their deſired Intentions in their Flights, and cou'd command back juſt as much as was neceſſary to their Inclinations and Occaſions, when weary or otherwiſe diſpoſed to ſuit their propoſed Ends; I ſay, if we cou'd diſcover or prove that this was the Caſe amongſt them (which I cannot ſee can ever by us, be more than a wild Conjecture) then might a Philoſophical Definition of the Art of Flying in Birds be expected, to anſwer to the ſame Degree, as the Movement of the Fiſhes in the Waters.

'upright in that ſubtile and yielding Medium, 'by its readily turning and anſwering every 'Vacillation of the Body.

'And now to the Parts ſerving for Flight, 'let us add the nice and complete Manner of 'its Performance; all done according to the 'ſtricteſt Rules of Mechaniſm. What Rower 'on the Waters, what Artiſt on the Land, 'what acuteſt Mathematician cou'd give a 'more agreeable and exact Motion to the 'Wings, than theſe untaught flying Artiſts 'do theirs! Serving not only to bear their Bo-'dies up in the Air, but alſo to waft them 'along therein with a ſpeedy progreſſive Mo-'tion, as alſo to ſteer and turn them this Way 'or that Way, up and down, faſter or ſlower, 'as their Occaſions require, or their Pleaſures 'lead them." Thus far that laborious, learned, and divine Philoſopher.

In which he has admirably well ſhewn the Wiſdom of God in thus adapting every Thing in the moſt curious Manner for the Purpoſes we find them deſigned for, and every Thing the Dr. has taken Notice of, together with the Situation of their Legs and Wings, are all certainly neceſſary for their Flights, but ſtill all this will not amount to a Philoſophical Concluſion, that even upon all thoſe Advantages which he has mention'd, that the Body of the Bird may therefore be buoy'd up into the Air, by the voluntary Will of the perceptive Faculty of the Animal, and carried at Pleaſure by its

its active Self-motion, as it were, in an Equilibrium with a Fluid, at leaſt twenty Times lighter than the Body that thus pervades it.

And therefore notwithſtanding the greateſt Helps I can find, I ſhall not pretend to account for this in any Experimental or Philoſophical Way, for tho' many Things neceſſary to this End have been mention'd, yet I find them to come ſhort, to me, of any ſatisfactory Concluſion to be drawn from thence, that therefore it muſt be ſo.

So that it muſt ſtill remain a Secret, how to give a clear Account, in a natural Way, by what natural Powers theſe winged Animals perform their Flights and Movements in the Air; for tho' we muſt allow that they are enabled to perform them in a natural Way, and according to the exact Rules of Proportions, yet the Diſcovery of this Rule, we find not yet clearly made, and which, perhaps, may ever remain a Secret to all after Ages in this State of Imperfection.

We know we can ſometimes put our Fancies upon the Wings and elevate them above all viſible Objects, and Appearances of all the glorious Heavenly Bodies; but we cannot elevate and carry our Bodies along with theſe Flights of Imagination: But theſe Tribes have Bodily Wings, whereby they can carry their Bodies into the open Firmament of Heaven; what Flights of Fancy and Imagination may aſſiſt them in theſe their Performances, I cannot tell;

tell; but, after all my Searches, I muſt at laſt fix it in a divine Arcana, to me unaccountable; I ſhall therefore ceaſe my Purſuit after it, and next enquire what Degrees of Intelligence we may ſuppoſe theſe Creatures to be endowed with.

Of their Intellectual Faculties.

§. 3. REASON is what Men, in general, fondly arrogate to themſelves, and that becauſe, amongſt the Inhabitants of this Globe, it is in the higheſt Degree to be met with in Man; but that we ſhould therefore imagine other Animals wholly deprived of it, I cannot think a neceſſary Concluſion, ſince,

Firſt, We find them capable of having their Parts improved by Teaching: And what would Man's Reaſon be without Cultivation? 'Tis true, Man is capable of much larger Cultivations than they, becauſe his Capacity is fitted for more advanced Reaſonings; and all Animals, that are not inſtructed or improved by Man, do naturally take ſuch Inſtructions from their own Progenitors, or Specie, as are common to their Kind, and agreeable to their Manner of Life; ſo that where Man does not interfere to deprive the young ones of their Dam's Educations, by taking them to their own, we find that each Specie ſeverally act after one and the ſame Manner; which ſhews their Reaſon to be governed by one and the ſame Law in Nature; and that, that

that Law always directs them to the beſt ordinary Means of their Self-preſervation; and which unerring Law in Nature, I humbly preſume, would have been alike obſerved in Man, had he not departed from that primitive Uprightneſs, which God at firſt created him in; for tho' at firſt *God made Man upright*, yet, ſince his Departure from that Rectitude, *he hath found out many Inventions*, which, had he continued upright, he would have had no Occaſion to have wrecked his Brains about.

If then the Inventions of Man have been chiefly the Reſult of his Departing from his firſt Purity; Shall we judge other Creatures quite void of Reaſon, tho' perhaps they had not ſufficient Reaſon given them to render them conſcious of Offence, and therefore not capable of offending againſt any Law that could be given them, ſince their ſmaller Portion of Reaſon could not render them conſcious of Guilt, by any Acts of voluntary Tranſgreſſion?

We plainly diſcover that any wild Fowl, or Bird, that is taken from its Dam in its State of Infancy, and brought up by Man, is capable of being inſtructed according to the Will and Pleaſure of the Man, as far as its Capacities can reach, or its Abilities perform: Thus if you were to take Male and Female of one Kind, and bring them up void of the Inſtructions and Methods of their Progenitors, and when they are come to Maturity, ſhould you then turn them out to the open World, they would be

utterly ignorant of performing the common Offices belonging to their Specie, and would utterly perish thro' their Ignorance how to act for a Livelihood, which must necessarily shew, that these Creatures are not entirely and only governed by Instinct, but are capable of learning, and do learn, by Instruction and Tuition, the very Law, we so fondly find the Name of Instinct for, but is to them the Law in Nature.

Whereas, was it only Instinct in the common Acceptation it is intended and understood; that would naturally abide in the Bird whether wild or tame, it would be so naturally fixed and riveted in its Nature, that it would be as impossible to deprive him of that very Instinct as it would be to change his Specie; and they would, however brought up and instructed, when set at Liberty to act for themselves, act in the very same Way and Manner as the Rest, if mere Instinct alone was the sole Director of their Actions; but as we find this Instinct (if you please to call it so) lost to the Bird by an uncommon Education, to be sure it must be lost by uncommon Instruction, and therefore the Result must be, as their Acts are uniform and alike in every Specie, where their Educations are not forced from amongst them, whether with or separate from their Dams, that instead of Instinct a constant Uniformity of Instructions do pass thro' the whole Race of each, which they faithfully adhere to throughout all their Generations.

Can we then deny that they have Reaſon, becauſe they act in perpetual Conformity? Or ſhall a perpetual Conformity to Reaſon, be only called Inſtinct, and therefore looked on, as by ſome, like perfect Machinery?

We ought to have more Regard and Eſteem for our Fellow Creatures than to imagine them made for no nobler Ends than to become our Vaſſals, and to be only ſubjected to our Wills and Pleaſures; no, they ought to be ſo treated by us, that our Treatments might beſt tend to preſerve them from Miſeries; and add to their Pleaſure and Comfort, during the Times of their Services; and thoſe, that we make uſe of for Food, we ſhould, in taking away their Lives, do it in the Way the leaſt afflicting to them that we poſſibly can, and rather with Regret than any Delight in the Act, thereby to turn it into an Act of Cruelty.

For, as by Man's Diſobedience the Creatures were made ſubject to Vanity, Life is of very little Value to them in the main, and Death may be their Deliverance; for, as Matters are now between us and them, they chiefly live and die for us, and not for themſelves: May they not therefore hope for a Deliverance into the glorious Liberty of the Children of God? *

Now, let us conſider what Arts Birds are capable of learning contrary to what are conſtantly obſerved in the Society of their Species.

In their Educations amongſt their Species they conſtantly obſerve one and the ſame Man-

* Which I purpoſe fully to treat on in another Tract.

ner and Form of Language. (if I may ſo call it) Some particular Species always obſerve the ſame Notes and Voices over and over again, in their muſical Strains, and ſome run to vaſt Varieties; and from every Kind we expect accordingly, and from repeated Experiments can tell what Notes and Voices to expect from ſuch and ſuch Kinds; that from ſuch we ſhall have a Variety of Notes, and from others only a conſtant Repetition of ſome few, or from ſome, only one ſingular Note, but none ever vary from their own Kind, while they have the Advantages of a free Education amongſt them, though ſo mixed and ranged amongſt one another.

§. 4. Moreover, many of this Tribe, above any other Animals, have been, and are frequently taught the Uſe of Words and Sentences in human Language, and ſome credible Relations there are of ſome that would give pertinent Anſwers to ſeveral Queſtions: How far they underſtand the Meaning and Signification of ſuch Anſwers, we may judge, from that both they, and other Animals of our Houſeholds, are eaſily inſtructed to underſtand what we ſay to them, in commanding them to perform the common Services appointed them, or in refraining them from the Actions they would have choſe to have done of their own Accord; and as thoſe, which cannot be taught to form our Language themſelves, yet may be taught the

Uſe of our Language, ſo far as to obey our Commands by it; ſo we may from thence reaſonably ſuppoſe, that theſe Creatures, that can learn to make Uſe of Speech, do arrive to ſome Glimmerings, at leaſt, of the Intent and Significations of the Words they uſe; and this chiefly may be attained by them from the Geſture and Behaviours of their Tutors and Familiars, from their Rewards or Diſcountenance ariſing from their Diſcourſes together; tho' it is not probable that they can ever arrive to the underſtanding of Words in the ſame Way of Acceptance that we do, yet this is to a Degree ſufficient to anſwer their own Purpoſe, and muſt, at leaſt, prove them endued with Reaſon and Intelligence, tho' of an inferior Degree to Man.

§. 5. But tho' Man, is, doubtleſs, very diſtinguiſhable from all other Animals by his ſuperior Reaſon, yet there are other Animals that are endowed with ſome ſuch ſurprizing Arts, that are requiſite to their Station and Welfare, that Man himſelf cannot come up to the Imitation of: As Birds, in the curious Make and Shape of their Neſts, which Arts are conſtantly preſerved and tranſmitted to the Young of every Kind, that have the Advantages of their Educations with their Dams or Specie; but is loſt by them, when they are deprived of proper Inſtructors, and what will never be made good to them by their Inſtinct; which ſhews that they learn by Tuition, and therefore have Reaſon in their own Sphere, and common Way of per-

petual Conformity to an unerring Rule; and, in which, the admirable Art in Birds contriving their Nests is very remarkable and worthy of a few Reflections.

Of Bird's Nests.

With what inimitable Art, do these Creatures, with much Industry and Care, bring together proper Materials, as Sticks, Straw, Feathers, Mois, Hair, Wool, and Dirt; and put them into commodious Order and Form, suitable to the different Occasions of their Kinds? With what Dexterity and Curiosity do they place every Stick, wind and adapt every Feather, Hair and Lock of Wool, and line them within, not only to make them commodious for themselves, but also for the Entertainment of their Young to nourish and bring them up? And with what Art and Forecast do many of them coat their Nests on the Outsides to deceive the Eye of the Spectators, that they may not discover their Habitations to molest them, as well as to preserve them from the Dangers of Storms and Tempests? 'And, says, Dr. *Derham*, with 'what prodigious Subtilty do some foreign 'Birds not only plat and weave the fibrous Parts 'of Vegetables together, and curiously tunnel 'them, and commodiously form them into 'Nests, but also artificially suspend them on 'the tender Twigs of Trees to keep them out 'of the Reach of rapacious Animals?

Thus

Thus every Specie are found to frame and adapt every of their Nests agreeably to their several Occasions, commodious for the most likely Ways to preserve themselves and their Young from Dangers, and to proportion them in their Bulks and Magnitudes to the Families they expect to bring up therein, and to place them in the most commodious Situations, where their's and their Young's Necessaries of Life may be supply'd with the greatest Ease, as well as to be most out of the Way and Observations of such, who were likely to plunder and destroy them.

So that their Actions are in one perpetual Conformity to the Law in Nature thro' the whole Race of every Specie; for in the common Acts of every Specie, every individual thereof are found to have their Shares in them, and their Capacities are found to be confined (while their Bodies are unconfined) to that one excellent Law and Method, which best suits with their common Occasions; and, having neither Genius nor Abilities to search out other Inventions, they therefore become excellent at the one Thing only needful, or at that Way which tends most to the Preservations and comfortable Subsistances of themselves and their young Ones.

§. 6. We find also, that many different Tribes change Climates at different Seasons, and spend one Part of the Year in some Climates and the rest of the Year in others. And that some

change the very Manner of their Existences in Summer and Winter. In one Part of the Year we have Multitudes of some Kinds come to visit us, and inhabit with us, who in another Part of the Year will quite relinquish us; from whence some have believed, that they remov'd their Quarters to *Egypt* or *Ethiopia*, and some have imagined to the World in the Moon.

But that the last of these can be an unsupported Imagination only, must be plain, *First*, from their Incapacity to live without Breathing, and therefore they cannot pass thro' the Vacuum between the Earth and the Moon, since they wou'd soon expire in an Air-pump with the Air exhausted.

Secondly, It must be impossible for a Fowl to fly without Air; for tho' their Flights in the Air have been considered as a Secret not to be quite accounted for in a Philosophical Way, yet that it is the Air that supports them in their Flights is undeniable, and that they can no longer be supported therein than they meet with a sufficient Quantity thereof to bear up their Bodies by the Motion of their Wings.

But the chief Cause of this Imagination has arose from the not discovering where those, that thus come and go, have their Abodes during their Absence, as the *Woodcocks* in particular, which come in great Numbers upon the Approach of Winter, and leave us upon the Return of Summer; but their Habitations, during their

their Absence, have not yet been discovered. But of this hereafter.

The Swallows and Swifts also leave us, and return at the contrary Seasons; but as for these it has been proved, that during their Retreats, many of 'em have been found concealed in a State of Inactivity and Insensibility; some in the Thatch of Houses; and some in Clusters taken out of the Waters, as Dr. *Derham* relates from credible Witnesses; and some hanging in Clusters amongst the Rocks, with Bills join'd to Bills, Wings to Wings, and Feet to Feet; and amongst other Accounts he gives us of this Kind, he tells us, that at a Meeting of the Royal Society, *February* 12, 1713, they had a further Confirmation of Swallows retiring under Water in Winter from Dr *Coles*, 'who, 'says he, was a Person very curious in these 'Matters, speaking of their Way of Fishing in 'the Northern Parts, by breaking Holes and 'drawing their Nets under the Ice, saith, that 'he saw 16 Swallows so drawn out of the Lake 'of *Somrodt*; and about 30 out of the King's 'great Pond in *Roskincilen*; and that at *Schie-'bitten*, near an House of the E. of *Dona*, he 'saw two Swallows just come out of the Waters, 'and could scarce stand, being very wet and 'weak, with their Wings hanging on the 'Ground; and that he had observed the Swal-'lows to be often weak for some Days after 'their Appearance.

Quails

Quails are also found to fly from us against Winter, and to return against Summer; but these have been observed by Travellers to cross the Seas at each Season backwards and forwards; some have seen them crossing the *Mediterranean* twice a Year, flying from *Europe* to *Africa* and back again. Dr. *Derham* tells us, that *Bellenius* affirmed, that he, upon his Voyages, had observed Quails flying from the North to the South against Winter, and from the South to the North against Summer over the Seas, and that many of them each Way had been taken in their Ship.

Now as for Woodcocks, or other Kinds, whose Habitations have not yet been discovered, during their Absence from us in Summer, it is much more reasonable to believe, that they do find out some Place upon our own Globe commodious for them, that we are not acquainted with, than elsewhere, perhaps, towards the South Pole; since it is plain they chuse their Abodes in Climates where Cold prevails, by abiding with us only in the Winter Season; and that they may thus suit themselves upon our own Globe is evident, and that it is most probable they do so, appears, from not only their Impossibility to fly to the Moon, but, even, supposing it possible, yet as no Place upon this Globe bears any Comparison of Distance from another, as the Moon does to this Earth, it is most reasonable to believe that they make their remote Abodes in the Southern Parts beyond

yond the Line, and South Tropick, where our Summer Travellers were never then invited to visit; for those that travel that Way must chuse to do it in our Winter and their Summer, which are the contrary Seasons of Woodcocks.

OBSERVATION.

§. 6. Now from hence we may observe, that as these Animals know their appointed Seasons of removing from one Station, or from one Climate to another, and that as some come when others go, and others go when these come, we may observe, that these Contraries are of different Temperature and Constitution of Bodies; one having the Fiery and Airy Element the most predominent, and the other the Earthy and Watery, so that the one cannot bear much Heat, nor the other much Cold; and as they are thereby, the one rendered incapable of comfortable Subsistence in Heat, and the other in Cold, and as they are fitted with such Instruments of Motions, and not so confined to Bounds as other Creatures, so they are thereby qualified to make their States (all the Year round) commodious to each by changing Climates that suit with their Constitutions, being endowed with the Knowledge of the Seasons proper for their Movements; as *Jeremiah* Ch. VIII. Ver. 7. observes: *The Stork in the Heaven knoweth her appointed Times,*

Times, and the Turtle, and the Crane, and the Swallow know the Time of their Coming.

And this Knowledge we may ſuppoſe to come to them by the gradual Changes of the Air, from Heat to Cold, and from Cold to Heat, when its Proceſſes in each begin to make their then Abode troubleſome, and irkſome to them, ſo that ſome then betake themſelves to ſolitary Abodes, and others to Climates that ſuit their Conſtitutions, *&c.* each of which Caſes exactly anſwer to their reſpective Purpoſes, and their proper Preſervation.

And as this Variety of Conſtitutions, in the different Tribes and Kinds of Animals, ſhews an admirable inexhauſtable Treaſure in the GREAT CREATOR's unlimited Power, ſo as each have their proper Methods for their own Preſervations, and comfortable Subſiſtance, it alſo ſhews, that they are all alike taken Care of and provided for accordingly, in all their various and contrary Exigences; whether it be for commodious Food or agreeable Temperature of Air, or for more advantageous Propagation and bringing up of their Young.

OBSER. II. Now that they alſo ſhould ſo exactly know their Roads in their Paſſages from one Place to another is wonderful; and we find it is a Knowledge God has endued them with, and let it be from what Motive ſoever, it is the ſame to them as Knowledge is to us, and therefore moſt fitly called Knowledge by us, as in the Text above cited. And we may obſerve

ſerve in all Creatures a Knowledge and Expectation of the Returns of Night and Day, of Heat and Cold, of Summer and Winter, and that ſuch, whoſe Neceſſities call for ſuch Proviſions in Winter that they cannot then procure, do, in Summer, very induſtriouſly lay up and preſerve ſuch Neceſſaries which will hold good in Winter, and, during that Seaſon, yield them a comfortable Subſiſtence. But as more of this with their remarkable natural Affections to, and particular Care of their Young, will fall in as ſynonimous with the Creatures of the Sixth Day's Work of the Creation; I ſhall in my View of them, have Occaſion to ſpeak of them together.

CHAP. XVII.

VERSES 24, 25.

AND God ſaid, Let the Earth bring forth the living Creature after his Kind, Cattle, and creeping Thing, and Beaſt of the Earth after his Kind: And it was ſo.

And God made the Beaſt of the Earth after his Kind, and Cattle after their Kind, and every Thing that creepeth upon the Earth after his Kind: And God ſaw that it was good.

§. 1. I have before taken a ſhort View of the firſt created Families and Tribes of the Inhabitants of

of the Waters and more particularly of the next mentioned, the winged Choriſters of the Air, who, have been obſerved, to be ſent as Harbingers to wait and attend upon Man at his Coming; yet theſe are not thought ſufficient by the All-powerful Creator to wait upon, and attend ſo great a Prince as Man; therefore God ſtill prepares more domeſtic Servants to attend him; for the Morning before Man was ſent to take Poſſeſſion of this new Fabrick, notwithſtanding the Furniture prepared, and the Servants already ſent before to wait his Coming; here are alſo now ordered Guards of a yet nearer Approach to welcome his Appearance, and to attend upon him with Duty and Allegiance.

But as Man ſoon loſt his full, ſupreme, and primitive Authority over them both to his own and their Subjection to Vanity, ſo I ſhall here alſo view them according to the preſent Situation they ſtand in with Relation to us; having Occaſion to treat ſomething concerning the primitive Purity when I come to the Creation of Man.

What has been elſewhere occaſionally conſidered before concerning them, will need no Repetition here; as in my Obſervations upon Vegetables, I took Notice there of the Multiplications of the Animal Species: But what belongs to them in general, I ſhall obſerve, with a few of the moſt remarkable Particulars,

to

ticulars, that have occurr'd to me, which, I think most worthy of Notice.

Now the Earth and Waters, by God's Command, the Day before, had brought forth the Fishes and Fowls, last treated of; they being created in the Seeds, in the Substance of the Chaos, and afterwards, in the Earth's Formation, thro' a due Temperature of the Sun's Rays, invigorated in their Pregnancy and brought forth to Maturity. And now upon the next Return of the Sun, the Earth becomes productive, in the like Manner of Four-footed Beasts, Cattle, and creeping Things, which by God's Command it brought forth in vast Varieties.

And herein we shall behold another noble Scene of the Great Creator's admirable Wisdom and no less infinite Power to adapt every Kind of such vast Varieties of these Land Animals in their Postures, Shapes, and Strengths to their different and proper Offices and Occasions of Life.

§. 2. I shall first take Notice that the Qualifications, necessary for the well being of Animal Life, are in common bestowed upon all, from an inimitable Art of the infinite Wisdom of the great and powerful Creator and Author of their Existence, who, by ministring a vital and perceptive Principle into Matter of itself purely passive, thro' certain, differently modified, variously organized, and unequal-

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ly proportioned Parts of the Elements, unaccountably fits them for Reſpiration, and actuates them with proper Organs of Senſation by an active Principle ſuperior to the Matter it actuates, from whence ariſe the Senſations, to all Land Animals, of Seeing, Hearing, Feeling, Smelling and Taſting, which are, in common conveyed to every Kind; and in ſuch Degrees as beſt ſuits the Occaſions of each, with the Foundation of a Law, therein included, of their Self-preſervation, together with a fixed Propenſity in all for the Propagation, Increaſe of, and a general Affection to, and Care of their Young.

And without this neceſſary Proviſion of theſe five Senſes, common to Animal Life, what Species of Animals could have any comfortable Subſiſtance? And theſe Senſes, as they are certainly what renders all Enjoyments valuable, ſo we find that every Species of Animals do in common enjoy them; and that the Deprivation of any one of them is accounted as an irreparable Detriment.

Tho' in ſome of Mankind eſpecially, the Great Creator's Goodneſs and Care of them does frequently compenſate the Loſs of one of the Senſes, with an extraordinary Quickneſs and Perception in the other, which together with the compaſſionate Concern of thoſe, who enjoy them all, that Loſs is made more tolerable to them, than it could poſſibly be if there were any of theſe Senſes wanting to all: But

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as there are very few without them all, but ſuch, who have loſt any by accidental Detriment. I ſhall therefore conſider them as poſſeſſed in common by all Species, with their moſt accurate Accommodations to the State and neceſſary Occaſions of every different Kind; ſome of theſe Senſes being quicker in ſome Animals than others, according as their own Occaſions, or their Services to Mankind require.

The Conſiderations of which do again demonſtrate the admirable Power and unſearchable Wiſdom of their infinite Creator: For ſuppoſe any Animal created with Perception, and could thereby move itſelf, and yet be deſtitute of theſe Senſes, in what State of Comfort could it exiſt? For ſuppoſing all Proviſions of Food made for it, that there now are; How would any Animal, without Sight, know how to ſeek for it? Or ſuppoſing it near Hand and eaſy to be met with; How would it know whether it was agreeable and proper for its Nouriſhment or deſtructive to its Conſtitution without Smelling and Taſting? And what Confuſions and Dangers muſt attend the whole Race of Animals without the Senſes of Hearing and Feeling? And how could the Mind of one be communicated to another, when neither Voice nor Tone could be heard, or Touch felt? Or how could Delights ſpring from melodious Muſick, or the ſweet and harmonious Sounds of the winged Choiriſters be

made any Ways ſerviceable to themſelves or delightful to the reſt of the Globe's Inhabitants? But by this Senſe of Hearing we have this added to all other Advantages, that we are hereby excited, with the whole Tribes of the Earth's Inhabitants to the elevated Praiſes of our benevolent Creator for his wonderful Goodneſs added to his infinite Power and Greatneſs, which thus run parallel with each other in beſtowing upon us theſe bountiful Qualifications, as well as preparing for us and every Species, ſuch plentiful Proviſions, ſuited to our Senſations, as well as to our ſeveral Wants and Occaſions.

§. 3. It is further obſervable that the Parts adapted for letting in four of the five Senſes, are in the moſt commodious and eminent Part of the Body, viz. the Head of every Animal, to convey the Senſe and Benefit thereof to every Member, which depend upon it as their Guide and Director, and to which they are gratefully ſubordinate and obedient, and joyfully ſubmit to its Government, and Directions, ſo that every Member will be ready, upon the firſt Notice of Dangers, to expoſe themſelves for the Preſervation of it, and rather chuſe themſelves to be wounded or cut off, than the Head ſhould ſuffer: And thus it is in all Bodies Politic, where the Vigilance of the Head thus takes Care of the Members.

So the Eyes, as the firſt and chief Senſe commit all viſible Objects to the Brain, to which

which they are nearly placed, where they are entertained and judged of according to the Capacity of the Animal, who frameth Conceptions of the Objects viewed; and as its Occasions or Concerns require, is either invited to approach the Object with Delight; or to shun it, if it threatens Dangers.

And as the Excellency of this Sense is great, so the Provision of it, in every Animal, is at least doubly afforded, by two Eyes, that the Loss of one by Accident may not wholly deprive the Animal of the Comforts and Advantages of Light.

So the Ears, for the same Purpose, are likewise two, and placed in the most commodious Part of the Head for Hearing, and also have their Seat near the Brain, and, by that Means, most readily give Intelligence of Dangers approaching, and in every Species has its Form and outward Superficies made and guarded according to the Occasions and Concerns of each Kind. And as in Birds there is no visible outward Superficies to annoy them in piercing thro' the Air; so in these Animals, whose Occasions are adapted to a different Way of Life, the outward Structure is as differently formed; in some large and open, and in some erect, where the Animal is chiefly exposed to Dangers, that they may the more readily be apprised of their Approach to make timely Escape: In some less subject to Dangers, the Flaps of the Ears hang over

the Orifice, and cover it to preſerve it from Offenſiveneſs.

Next to the Ears is placed between them and the Eyes, the Noſe, for taking in and communicating to the Brain, (to which alſo it is nearly placed) all Scents or Smells, whether odoriferous or noxious, by which the Animal is either invited to the Pleaſures flowing from the agreeable Delights of that Senſe, or to ſatisfy his Hunger with the agreeable Food to which the Smell has recommended the Animal its Choice of Fruition in Taſte, to the ſatisfactory appeaſing his Hunger.

And this Senſe of Taſting is alſo placed below the Noſe, or Organ of Smelling, *viz.* in the Tongue and Roof of the Mouth, which are alſo near the Brain: And as theſe four Fountains of Senſe are ſeated in the chief Eminence of the Body, ſo the fifth is communicated from the Brain to every Part of it, and make the whole Partaker of the Benefits of all: Thus theſe Senſes are continual Watches and Guards of the Body, and if any Member thereof ſuffers, the Senſe of Feeling immediately alarms the Brain to awaken all the other Senſes to a better Inſpection and Guard for the future, ſince one ſingle Member of the Animal cannot ſuffer, but its whole Body is with it diſordered.

Thoſe, who have been curious in the Search into the Anatomy of different Species of theſe Creatures, do acknowledge, that throughout the

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Varieties of Animals, and throughout every Part of every Species, they are always found ſurpriſingly to anſwer in their different Makes, and Forms; Tendons, Arteries, Muſcles, Nerves, Bones, *&c.* to their different Occaſions, and Manners, and Ways of Life.

Thus how variouſly are the Eyes of different Animals commodiouſly ſuited to their Occaſions; and in Hares and Conies their Eyes are very protuberant, and placed ſo much towards the Sides of their Heads, that their two Eyes take in near a whole Sphere: Whereas in Dogs that purſue them their Eyes are ſet more forward in the Head to look that Way more than backward.

§. 4. In ſome Animals, that have no Neck, to give a Motion to the Head, as in *Spiders*, it is obſerved, that they are accommodated with a greater Number of Eyes, in ſome four, in ſome ſix, in ſome eight, placed in the Fore-front of the Head, to watch and diſcover their Prey that Way.

§. 5. So the *Camelion*, whoſe Head is alſo fixed to her Shoulders, has an admirable Proviſion made to ſupply that Defect of not turning her Head: Her Eyes, ſays Dr. *Goddard*, are ſet in a verſatile globular Socket, which ſhe turneth backward or any Way without moving her Head, and ordinarily one a quite different or contrary Way to the other.

'Tis alſo obſerved, that the *Camelion* will move one Eye while the other remains immoveable, or turn the one forward, while the other looketh behind; or the one to look up to the Sky, while the other is fixed on the Ground; ſo that tho' her Head is fixed to her Shoulders and rendered immoveable, this Faculty in her Eyes ſufficiently compenſates that Deficiency, ſince thereby ſhe is enabled to ſee what is done as well behind, as before her.

Sir *Iſaac Newton*, in his *Opticks*, gives the Reaſon, from the Anatomy of Animals for this different Way of Viſion in ſome to others; where, he ſays, 'Are not the Species of Objects ſeen with both Eyes united, where the Optick Nerves meet before they come into the Brain? The Fibres on the Right Side of both Nerves uniting there, *&c.* For the Optick Nerves of ſuch Animals that look the ſame Way with both Eyes, (as of Men, Dogs, Sheep, Oxen, *&c.*) meet before they come into the Brain; but the Optick Nerves of ſuch Animals as do not look the ſame Way with both Eyes, (as of Fiſh and the *Camelion)* do not meet, if I am rightly informed.'

Thus are the Senſes, and Parts adminiſtring to them, found to anſwer all the peculiar different Occaſions of their ſeveral Species, but as I cannot pretend to be qualified for nice anatomical Enquiries into the curious and different Diſpenſations of the vaſt Varieties of the Diſtributions of Providence to the various Makes,

Shapes,

Shapes, and Ways of common Life amongſt the numerous Tribes of this Day's Creation, I ſhall therefore only make a few more Remarks upon ſome uncommon Particulars.

§. 6. Before I proceed thereto, however, give me Leave to obſerve in the General; That all living Animals, enjoy the five Senſes as well as Man, and ſome of them in greater Perfection, (as will hereafter be further confirmed) and as it is from the Enjoyment of theſe Senſations that Pleaſure or Pain do ariſe, and are procured or occaſioned; and as it appears that they have, an equal Share with us of theſe Senſes, and ſome of them a quicker and clearer, it muſt unavoidably follow, that therefore they are endued with as acute Perceptions of Pleaſure or Pain ariſing therefrom; excepting this only, that we are more capable to heighten, and encreaſe either our Pleaſures or Pains by how much more we are capable of Reflection, and extending our Hopes or Fears at a Diſtance, which Difference in this Reſpect may be obſerved by what I ſhall next proceed to conſider.

Of their Intellectual Faculties.

§. 7. Theſe Tribes are alſo many of them capable of Inſtructions by Mankind in ſeveral very curious Performances, and ſome of them are appointed for a near Approach to, and At-

tendance upon Man, and which Man by his Choice commonly makes his domeſtic Servants, as particularly Dogs, of which there are a vaſt Variety of Sizes and Kinds, ſuited to different Uſes, Services, and Occaſions; all which to enumerate is beyond my Sphere, and muſt not therefore come within my Intentions.

I ſhall therefore only make an Enquiry into their common Capacities of Intelligence, which in the General are found according to their various Makes and Uſes to be capable of Inſtructions and are found to become more or leſs uſeful, or more or leſs perfect in their Services, as they meet with proper Inſtructors, by which ſome of them arrive to amazing Performances; and moſt are taught to underſtand ſo much of their Maſter's Language, and others, as to anſwer their Commands or Prohibitions; tho' none of the whole Tribe of theſe Animals, nor any of the Quadrupeds are capable of learning the Uſe of Words or Sentences themſelves in human Language, as many of the Birds can; they being diſtinguiſhable in the Poſture to Quadrupeds, and coming nearer to that of Man both in the Poſture of two Legs, and changeable Tones of Voice.

But tho' the Fowls are made more capable of learning Man's Language, yet we find that both Dogs and other four-footed Animals are as capable of underſtanding Man's Language as they, ſo that, even, all that are appointed to be Man's particular Servants and Attendants do enjoy that Degree of Intelligence, to learn ſo much of

their

their Maſter's and other's Language as is neceſſary for all their Offices, Services and Performances: Thus Horſes, in all their particular Branches of Allegiance, will act according to their common Appointments, and readily obey the Words of Command in the Services they are properly appointed to, and ſet apart for: Likewiſe Cows, Sheep, *&c.* will know their Maſter's and Miſtreſs's Calls, and come and go as they are thereby commanded.

Theſe, then, cannot be ſaid to act according to mere Inſtinct only, which would be to imagine them to be no more than Machines actuated purely by the Tones and Voices of their Commanders, which like Cords and Weights put the Springs of the Machine into ſuch Movements. But that this cannot be the Caſe will ſufficiently appear, in that there is a Will concerned in theſe Animals, inducing them, upon Conſiderations, either to obey the Command of Choice, in hearing it, or elſe of Choice deſerting it; and when they do, of Choice, thus diſobey, they will be apprehenſive of the Diſpleaſure of thoſe who gave them the Command; and will upon their Reproval for it ſhun an expected Puniſhment; or if it be from their Maſters, from whom they cannot hope to eſcape, they will fawningly ſubmit, and as it were ask Pardon, as if it was an undeſigned Offence; and rejoice to receive another Command to evidence their Obedience; which can never be the Effects of Machinery, but of Intelligence,

ligence, Will, and Choice, in as great a Degree as it is apparently.

And this is further confirmed by the Excellency of ſome, that have proper Inſtructions, and the Ignorance of others, which have the ſame Capacities, for want of proper Cultivations thereof, ſince by proper Tuition they have their Capacities enlarged to perform ſuch Actions as Inſtinct could never have produced from them.

And as Dogs, as above obſerved, are the neareſt Attendants upon Man of any Fourfooted Animals, ſo generally they have their Educations amongſt them, and from them; by which they become the moſt familiar with them, which is agreeable to their deſigned Uſes and Services; for were they to be brought up as wild Animals, they wou'd ſcarcely find a Way for their own Subſiſtence, they wou'd not have the Cunning of a Fox, or the Agility of an Ape, nor Craft of a Badger; but the Fox, the Ape, and the Badger, *&c.* not being deſign'd to be ſo familiar with Man, (tho' capable of being tamed and inſtructed) have ſuch Faculties and Intelligencies beſtowed on them as are neceſſary for their proper Stations; of which ſome Remarks hereafter.

§ 8. It is very obſervable in Dogs, to what a prodigious Degree the Senſe of Smelling is advanced, in ſome of them in particular; even to the Diſcovery of the Smell of the Footſteps

of

of any of the Family they belong to, and other Perſons they are acquainted with; ſo that when they have been ſometimes confined within Doors, after the Perſon they coveted to go along with, has been gone out a conſiderable Time, and they have been ſet at Liberty, they have exactly followed his Footſteps by the Smell, even thro' Roads that have been paſſed and repaſſed, and croſſed by Multitudes of Paſſengers, during the Time of the Man's Paſſage from the Place, where the Dog was confined from following him immediately; yet the Dog has from thence ſtraight purſued and found his Maſter or the Man he wanted to go along with, at ſeveral Miles diſtance.

A remarkable Inſtance of this Dr. *Derham* acquaints us with from Mr. *Boyle*, of a Tryal of a young Blood-Hound, belonging to a Perſon of Quality, who to experience whether he was well inſtructed, 'cauſed one of his Servants 'to walk to a Market Town four Miles off, 'and then to another Market Town three Miles 'from thence.—The Dog, without ſeeing the 'Man he was to purſue, followed him by the 'Scent to the abovementioned Places, notwithſtanding the Multitude of Market People that 'went along in the ſame Way, and of Travellers that had Occaſion to croſs it. And when 'the Blood-Hound came to the firſt Market 'Town, he paſſed thro' the Streets without 'taking Notice of any of the People there, 'and left not till he had gone to the Houſe,

'where

'where the Man he ſought reſted himſelf, and 'found him in an upper Room, to the Wonder 'of thoſe who followed him.'

Accounts of the like Performances are ſo common that it would be needleſs to enumerate more, ſince they are ſo publick amongſt us. I ſhall therefore proceed to take Notice of the admirable Oeconomy and Government of ſome of the wilder Creatures of the four-footed Kind; for tho' I only purpoſed to treat of them in general, yet ſome in particular I think worthy of diſtinct Conſideration, from whence we may the better judge of their Capacities of Intelligence.

§. 9. The admirable Oeconomy of Beavers deſerves particular Conſideration. They are a kind of amphibious Creatures, who always chuſe their Habitations by Waters, and whoſe admirable Arts, Contrivances and Operations in building their Houſes comes the neareſt to the Imitation of thoſe built by Man: Theſe by Companies enter into Societies, and unite in the Completion of thoſe curious Buildings: They have a ſtrong ſet of ſharp Teeth, with which they cut down ſmall Trees, or large Branches, which they alſo ſhape with the ſame Inſtruments, and form them proper to make ſtrong corner Poſts; and by their Strength in Numbers, carry to the Place agreed on amongſt them for their Habitation; where they dig Holes with their Feet to ſet in and faſten their Poſts, and place them

in

in a ſquare Poſition to one another; and afterwards as artfully ſhape and fit other Pieces of Wood, which they lay acroſs for two Stories, and faſten them ſo, that with ſmaller bending Boughs or Twigs of Trees they wattle them, then, with their Tails, (which they uſe as a Maſon does his Trowel) they bring together a Quantity of Clay and temper it therewith, and daub them both without and within; and thus they alſo finiſh their Chambers and the Roof above: One of theſe Chambers is to lay up Proviſions in, and the other for the Production and bringing up their Young: Their Proviſions they carefully lay up in Summer againſt Winter: The Ground Floor they always accommodate and ſet a part for their Place of Reſt and Sleep, and ſo order it as to have a Place juſt ſo far above Water, that they may ſit above it, and keep their Bodies dry, and have their Tails in the Water, during their Repoſe, which is commonly in the Day Time, the Nights being their Time for Work.

And it is credibly affirmed, that they have ſeveral Degrees of proper Officers, as regular as in human Societies: There are Commanders, Contrivers, Overſeers, Workers, Correctors, *&c.* And if there be any amongſt them, that do not faithfully diſcharge their proper Function, they are firſt order'd, and given Correction, and if they are thereby amended, they are continued in the Society, otherwiſe they are afterwards beaten and turned out as uſeleſs Members of their Band. § 10.

§ 10. And tho' few Herds of Quadrupeds come up to ſuch Regularities, and Dexterities, yet there are alſo others that enter into Communities, and have a certain Government, as it is common amongſt the Conies to ſet Watches or Centinels by Turns, while a Company goes out to feed, that, upon any viſible Approach of Danger, give Notice, by a Cry, for thoſe abroad to return in Haſte.

But my preſent Purpoſe being only to give a few Sketches of theſe Things to embelliſh my Enquiry into their Intellectual Faculties, I ſhall paſs by Obſervations of the Fox's Cunning, the Ape's Agility, *&c.* which are commonly known to all.

And in theſe few Inſtances, which I have given, as in every Individual of the Works of God, we may behold his ſurprizing Wiſdom, Power, and Goodneſs; and we ſhall find it impoſſible to view any of his Works, where we ſhall not find true Adjuſtments, in adapting them, as in every individual Species, which are fitted to, and qualified for their proper Offices, according as their Conſtitutions, Ways, and Manners of Life require.

Of their Poſtures.

§ 11. Thus the Poſtures of theſe numerous Families, as they generally take in their Food from Herbs and Graſs; or ſome from the Preys they can catch and devour, ſo their Necks are made

made proportionably long, that they may reach their Heads to the Ground with Eaſe, and they are fitted with Teeth ſuitable to the Food deſign'd for their Subſiſtence: There is alſo ſtill a more excellent Proviſion made them, for their Eaſe in their prone Poſture, in holding down their Heads to feed, by a ſtrong Tendon or Ligament, commonly called Paxwax, braced from the Head to the Middle of the Back. 'By which means, ſays Dr. *Derham*, the Head 'altho' heavy may be long held down without 'any Labour, Pain or Uneaſineſs to the Muſcles 'of the Neck, that wou'd otherwiſe be wearied 'by being ſo long upon the Stretch.

Of their Stomachs.

§ 12. Their Stomachs are alſo adapted to their reſpective Food, as well in the Carnivorous, as the Herbaceous Kind; in all which, the Works of God are ſingularly ſurprizing, in their Varieties and Adjuſtments; and we ſhall ſtill find the ſame from a ſhort View of creeping Things.

CHAP.

CHAP. XVI.

Of INSECTS.

§. 1. THO' moſt Inſects become in their mature State winged, yet they come in with this Days Creation; for all whether winged or not that have more Feet and Legs than two, we may aſſign to creeping Things, which Poſture moſt of them are confined to in their firſt Stage of Life: And amongſt theſe alſo there are ſuch vaſt Varieties of Kinds, that, I think, it is impoſſible for any Man to deſcribe the Whole, with all the Aſſiſtances he can procure.

§. 2. And tho' they appear as the moſt minute Part of the Creation, and ſome imagine many of them owe their Productions to Heat and Putrifaction, 'yet, ſays Dr. *Derham*, we 'ſhall find them noble, and moſt admirable 'Works of God.' And then he proceeds to quote the famous natural Hiſtorian, as he ſtiles him, *Pliny*, who, prefacing his Treatiſe of Inſects, to prevent the Reproach of Condeſcenſion (as might be thought) to ſo mean a Subject, therein ſays, 'In great Bodies Nature had a 'large and eaſy Shop to work upon Obſequious 'Matter. Whereas, ſays he, in theſe ſo ſmall, 'and, as it were, no Bodies, what Footſteps

'of

'of Reaſon, what Power, what great Per-
'fection is there! Of this having given an In-
'ſtance or two of the exquiſite Senſes, and cu-
'rious Make of ſome Inſects, he then goes
'on, We admire the turrigerous Shoulders of
'Elephants, the lofty Necks and Creſts of
'others, but, ſays he, the Nature of Things
'are never more complete than in the leaſt of
'Things."

Thus in the Art of Man, what is judged more admirable than the Contrivances of the ſmalleſt and moſt minute Curioſities, ſuch as the preſent famed Coach and Coachman, with the Figure of a Man in the Coach, all drawn by a Flea with a Silver Chain? or ſuch as a Cup, which Dr. *Derham* tells us of, made of a Pepper Corn by *Oſwald Nerlinger*, that held 1200 little Ivory Cups, all gilt on the Edges, and having each of them a Foot, and yet afforded Room for 400 more?

Things of this Nature are generally eſteemed the moſt admirable Pieces of Curioſity; and it is certainly Matter of Wonder to find human Art ſo far extended, as to be ſo very rarely imitable; and the Imitation of Nature in the moſt minute Performances is always judged much more curious than to do it in Pieces of Bulk and large Subſtances.

So that it muſt, at leaſt, be acknowledged, that as much Wiſdom and Power will appear in the moſt minute Works of the Creation as in the greateſt.

For how unaccountable muſt it be to find living Creatures not to be diſcovered by the naked Eye, which, by the Help of Microſcopes may be ſeen to appear very beautiful, in which no rude, ill-made Work, or Blemiſh can be diſcovered, as in all the artificial Works of Man, in which the moſt poliſhed appear rough and incomplete.

But in theſe Animalcules not diſcoverable without Microſcopes, and which are many Times leſs than a ſmall Grain of Sand; yet one of theſe has all the Parts of an Animal contained in ſo ſmall a Compaſs, as Joints, Bones, Muſcles, Tendons, and Nerves neceſſary to adminiſter to its Motion, and Manner of Life, ſo that there is in this little Compaſs a whole and complete Body exquiſitely formed, and as neatly adorned as the largeſt Animal, having an Head with Eyes, Ears, Mouth, and Noſe; likewiſe a Stomach, Intrails, Legs, Feet, and every other Part belonging to an Animal Body. 'And every one of theſe Parts, ſays 'Dr. *Derham*, have the neceſſary Apparatus 'of Nerves, Muſcles, and every other Part that 'larger Inſects have, nay, and all guarded with 'a well-made Tegument neatly adorned."

Amongſt the Tribes of Inſects there are undiſcoverable Varieties of Kinds, and ſuch Degrees of Magnitudes amongſt them, that I doubt not but an Ant would appear, to one of the ſmalleſt Animalcules, as monſtrouſly big as an Elephant does to a Mouſe: And the real

Mag-

Magnitudes of Bodies ſeem to conſiſt chiefly in Compariſons.

Of the Intellectual Faculties of Inſects.

§. 3. The Intelligence common amongſt theſe Tribes chiefly conſiſts in their admirable Proviſions for themſelves and Securities againſt Winter, together with their particular Care for the Preſervation of their Species.

For we do not find that any of theſe Kinds are capable of learning any Thing from Man's Inſtruction; but that they all follow their own eſtabliſhed Law in Nature agreeable to their Kinds; and from which no Inſtructions can ever make them deviate; tho' there is one Kind of theſe that Man has ſubjected to adminiſter to his Advantage, *viz.* The Bees; and of theſe it may not be amiſs to obſerve ſome Things in particular.

§. 4. For as amongſt the Beavers, ſo theſe have a particular and regular Oeconomy amongſt themſelves, and as natural and diſtinct a Government, as is found in a well diſciplined Army; every Company whether in Hives or otherwiſe in Hollows of Trees; they have their King, their Commanders, Leaders, Overſeers, Centinels, Door-keepers, Workers, *&c.* and if any are obſerved not to act in their proper Spheres, or to be idle or ill employed, they will break their Wings, and drag them out of

their Hives or Habitations, and turn them to ſtarve.

In the Production of their Young, they ſend out of the Hive or Habitation of the Parent Bees a whole Company or Society together, when they become capable of entring upon Action, and to form a Government amongſt themſelves; and this always happens in the Summer Months, that are a proper Time for their Labour and Induſtry.

And of this Kind, Man has ſubjected the moſt of them to his own Inſpection and Service by fixing them Habitations in Hives near their own Houſes; from which when a young Breed take upon them the common Way of Life: The firſt that moves out of their Place of Production is a Bee about twice as long as any of the other of them, after him the whole Company, that had their Productions, Educations, and Riſe to Maturity together do all follow; which being carefully watched and obſerved by the Owner of the Hive (as is frequent in Country Villages) they take a Pan of Braſs or Iron, and ſtrike upon it with a little Hammer, or the like, to ring it, by the Noiſe of which, the King of the Company, that firſt led the Way, is invited not to depart far from the Place, but will, by the muſical Sound of the Pan chuſe to fix upon the firſt convenient Bough or Branch of ſome Tree or Shrub that he firſt meets with, where the whole Company gather about him in a Bunch or Cluſter; then the Owners,

Owners, being provided of a Hive rubbed within with Honey, take it and hold it with the Bottom upwards to the Bough on which they hang, and ſhake the Bough till the Bees leave it and fall into the Hive; then they turn it downwards upon a Sheet or Blanket and place it on the Ground, having a ſmall Door or Paſſage at the Bottom for them to come in and go out; and ſuch as had been accidentally ſcattered, and not happened at firſt to be taken in, will naturally ſeek to find the Place where the Reſt have taken up their Abode; where they will ſoon put themſelves in Order, and then being placed according to the Diſcretion of their Owners, they will go to work, if their King be amongſt them, otherwiſe, if perchance he be not taken in, they will be in Diſorder and Confuſion till they can find him.

An Inſtance of which I had from a very creditable Country Gentleman and Farmer, a particular Acquaintance, and, for five Years, a near Neighbour, who kept many Hives of Bees. He once having hived a Swarm, after the aforeſaid Manner, he found them very uneaſy, diſcompoſed, irregular, and unſettled, which cauſed him, with ſome of his Family to watch very carefully after them to ſee the Event; and, during their Watch there came two of the common Bees over his Farm Barn, bearing their King upon their Backs, and ſeeming very joyful entered the Hive with him, upon which

the Commotion ceaſed, and all appeared in a ſettled and regular Order.

The ſame Gentleman alſo, upon a Swarm of his Bees, obliged me with a Sight of their King, who, according to my beſt Obſervation, appeared no thicker than the reſt, but about twice as long.

If theſe Bees are not taken Care of, as above, upon their Swarming (which is always in the Day-time, and Heat of the Day) they generally convey themſelves to ſome commodious hollow Tree, and there form and build an Habitation from a Wax, with which they firſt make Combs and Cells, therein to depoſite Honey in Summer, on which they live in Winter, and alſo to be the Reſerve of a new Progeny which they ſend abroad the ſucceeding Summer.

I alſo obſerved, that the Gentleman, above mentioned, ſeldom choſe to deſtroy his Bees to take their Honey, as the Practice of ſome is, but would pretty early in the Summer, drive his Bees out of the Hive, which they had pretty nearly ſtored, into an empty one, by covering them both with a Sheet or Blanket, and applying the Bottom of the empty Hive, rubbed within with Honey, to the Paſſage or Door of the full one, and then beating upon the full Hive with a ſmall Stick, the Bees leave the full Hive of Honey and retire into the empty one, which he then placed in the Room of the other; where the poor Bees in this

this new and unſtored Habitation go to work again, with their utmoſt Diligence, and get what Proviſions they can the remaining Part of the Summer, for their Winter's Relief, which ſometimes they do if the Summer favours, to Satisfaction, otherwiſe this Owner takes Care to help their Wants as he ſees their Occaſions require, as indeed it is his Duty as well as Intereſt.

But tho' theſe come within the Management of Men, yet they come not within their Inſtructions, nor do I diſcover that any of theſe Tribes, I am now ſpeaking of do: But their Intelligence ſeems entirely confined to one and the ſame Way of acting, and to be influenced, in every Species by one and the ſame Method according to their Kinds, which tho' they may be prevented by Man, yet can never be otherwiſe inſtructed by him.

We may, indeed obſerve, that they enjoy the Senſes common to other Animals, and that in ſuch Degrees as ſuit beſt their different Occaſions and Ways of Life; ſome accordingly enjoy one and ſome another Senſe, as beſt ſuits their Purpoſes, quicker than the reſt.

But as all Animals are in general endued with Life, and Perception, and the common Senſations of Seeing, Hearing, Feeling, Smelling, and Taſting, they muſt neceſſarily be capable of having Pleaſure or Pain conveyed to them thereby, and from thence will be directed

to act: And therefore, for their own Advantage of Eaſe and Pleaſure, will endeavour to ſhun whatever appears diſagreeable and hurtful, and will embrace whatever offers and affords them Satisfaction, Eaſe, and Pleaſure.

And theſe Things we find in all Degrees of Animals from the higheſt to the loweſt Degree of Intelligence.

And may we not diſcover the Uſe of Reaſon in *theſe Acts?* Is it not a reaſonable Way of acting? Let us conſider, Whether it is more reaſonable to act in Uniformity or out of it?

§. 5. *Solomon* certainly aſcribes *Wiſdom* to the Ant; and ſends the Sluggard to her to learn Wiſdom. And if her Ways are inſtructive to Man, and worthy of his Imitation, tho' we find the whole Species to act in one and the ſame Way, then certainly they act not unreaſonably, becauſe they act in Uniformity; but for that Reaſon they act wiſely: They muſt therefore be allowed to have ſuch Degrees of Reaſon, as exactly ſuit their Conveniences and Ways of Life, and to guard, as much as poſſible, againſt common accidental Detriments: And it muſt be Wiſdom in them to act ſo as will beſt conſiſt with their own Welfare and Preſervation; nay, to act otherwiſe, as it would ſhew Irrationality in them, therefore it muſt be reaſonable in them to act as they do, and how any Animal can act reaſonably without Reaſon, I cannot yet diſcover: But as they have never been found

to

to act contrary to Reaſon they are fitly offered as a Pattern of Man's Imitation, whoſe ſuperior Reaſon, having alſo a ſuperior Knowledge added to it, has led him to many Inventions and Acts of Folly and Indiſcretion.

With what Induſtry and Diligence do the Ants labour in Summer to lay up Proviſion in their Store-Houſes for the Winter? With what Care, Tenderneſs and Affection will they uſe all poſſible Means to preſerve their Young, and expoſe themſelves to the greateſt Dangers to ſecure them, never leaving them expoſed or forſaken, but will remove them from Places they think dangerous to others of more Safety; ſometimes from one Side of their little Hills to the other, as ſuited beſt for their Conveniencies of proper Warmth, and to ſecure them from the Dangers of Colds or Rains.

'Sir *Edward King*, ſays Dr. *Derham*, who 'was very curious in examining into the Gene-'ration of Ants, obſerves their great Care and 'Diligence. 1. About their Sperm, or true 'Eggs, which is a fine white Subſtance like 'Sugar, which they diligently gather together 'into an Heap when ſcattered; and on which 'they lye in Multitudes (I ſuppoſe by Way of 'Incubation:) 2. I have obſerved, ſays he, in 'Summer, that in the Morning they bring up 'thoſe of their Young (called Ant Eggs) to-'wards the Top of the Bank: So that you may 'from Ten in the Morning, until Five or Six 'in the Afternoon, find them near the Top

'for

'for the moſt Part on the South Side of the 'Bank. But towards Seven or Eight at Night, 'if it be cool or likely to rain, you may dig 'a Foot deep before you can find them.

§. 6. I ſhall only amongſt theſe numerous Species of Inſects further take Notice in Particular of the uncommon Voraciouſneſs of the Spiders, who will devour other Creatures much larger than themſelves. I have before occaſionally taken Notice of their Particularity in their Multiplicity of Eyes, which is not to be obſerved in any other Creatures, that I have heard of, and as theſe ſeem to be the moſt voracious Animals according to their Sizes, ſo this Proviſion enables them to have Eyes every Way upon their Prey.

Her Cunning in betraying and catching her Prey, is beautifully deſcribed by Mr. *Philips*, in his *Splendid Shilling*, with which Simile he illuſtrates his Diſcant upon Catch-Poles.

——————— *So her diſembowell'd Web,*
The Spider in a Hall or Kitchen ſpreads;
Obvious to vagrant Flies ſhe ſecret ſtands
Within the woven Cell; the humming Prey,
Regardleſs of their Fate, ruſh on the Toils
Inextricable; nor will ought avail,
Their Arts, or Arms, or Shape, of lovely hue,
The Waſp inſidious, and the buzzing Drone,
And Butterfly proud of her expanded Wings,
Diſtinct with Gold, entangled in her Snare

Uſeleſs

Uſeleſs Reſiſtance make; with eager Strides
She tow'ring flies to her expected Spoils,
Then, with envenom'd Jaws, the vital Blood
Drinks of reluctant Foes, and to her Cave
Their Bulky Carcaſes triumphant drags.

I have very often ſet Flies at Liberty, and preſerved them from the Jaws of Spiders, when they had been entangled in their Webs, and when I have diſengaged them, and afterwards taken ſome time to remove the Bandages that remain'd about them; I have imagin'd, beſides a ſeeming Joy in them for their Deliverance, a kind of Gratitude ſhew'd me in Return, in the beſt Manner I cou'd expect from them.

Now having judged the Spider worthy of Death for attempting the Death of the Fly, and actually deſtroying all ſhe cou'd; I have, with a Feather dipped in ſweet Oil, anointed the Head of the Spider, which in a few Minutes after has died upon it.

From whence I conclude, that it is by a venomous Sting that Spiders kill their Prey, ſince ſweet Oil that acts againſt Poiſon ſo ſoon deſtroys them. Dr. *Derham* tells us, that Mr. *Leeweenhoeck* put a Spider and a Frog in a Glaſs together, and the Spider ſtung the Frog to Death in about an Hour's Time. Yet he ſays that ſeveral Perſons, as well as Birds, have been known to ſwallow them without Hurt, from whence Dr. *Nathaniel Fairfax* judged them not venomous: And that he himſelf had known a

Perſon

Perſon of Learning, who, was adviſed to uſe them medicinally at firſt, would afterwards, at any Time, ſwallow them, affirming them to be ſweet and well taſted. But let them that ſo like them, enjoy them for me.

I ſhall now only further obſerve ſome other Things generally remarkable thro' the whole Tribes of theſe Animals. As,

Their different Securities againſt Winter and Propagations.

§. 7. Some of them undergo different Kinds of States, and Denominations of Inſects, as being firſt Maggots, then Worms, and at laſt winged Flies.

The Butterfly ejects her Seed chiefly upon Cabbages, where it is nouriſhed and fed till it becomes a Caterpillar, and in this State remains all Winter, and theſe, always in due Time before Winter, retire in great Companies to Places of Security, creeping up Walls and Poſts of Houſes, and by the Help of ſome diſembowelled Filaments, they hang themſelves to Ceilings, in Country Villages creep into the Thatch of Houſes, and ſecure themſelves from Wet and Cold, and continue thus in a State of Reſt, and without Action, till, by the Warmth of the next approaching Summer, they are tranſmuted into Butterflies.

The various Ways of different Inſects in the Propagations of their Species may be ſeen largely

treated

treated on by Dr. *Derham* (in his *Phyſico-Theology*) who has diligently enquired into theſe nice Speculations: But as it is beſides my Purpoſe to enter upon many Particulars, I ſhall only here take Notice in general, that each Species with the moſt natural Care and Tenderneſs, and utmoſt Regard, take the propereſt Methods in their Propagations for the Preſervation and Encreaſe of their Progeny.

§. 8. Few of them breed in the Way of other Animals; for thoſe, that produce their Species by Eggs, do, each of them, generally repoſit them in Places for both their Hatching, and Nouriſhment. Thoſe that do it by Sperm eject it into proper Receptacles that will ſecure it in the Embrio (Accidents excepted) and alſo afford it proper Nouriſhment till it becomes capable of Action in the Sphere, or firſt State, of its Species. Some Kinds eject their Seeds into Leaves of Trees; ſome into Fruits of one Kind, and ſome into Fruits of another Kind, ſome into the Fleſh of Animals, *&c.* And ſome, whoſe Subſiſtance is moſt in the Waters, lodge their Seed there, and every of them in ſuch Places as beſt ſuits with the Security, Nouriſhment, and Production of their Progeny.

And it is alſo obſervable, that the ſmalleſt Animalcules, which are moſt expoſed to Dangers, and are made Preys of in great Multitudes together, are ſurprizingly numerous in their Encreaſe, ſo that tho' vaſt Numbers are

every

every Day, in Summer, that Way, deſtroy'd, and many more, notwithſtanding their Care for Security, do accidentally periſh in Winter, yet the prodigious Multitudes that do appear every Summer, muſt neceſſarily ſhew their Productions are as extraordinary as the Smallneſs of their Sizes: And as theſe Animalcules are found on the Surface of the Waters, 'tis very probable alſo, that many of 'em float in the Air, they being frequently found on the Tops of Houſes, in Water-Pots, and the like.

§. 9. And that all of theſe, from the greateſt to the leaſt, do propagate by Male and Female, and are in the Seed of the Male originally, but are not from thence formed into Animals of any reſpective Kind, without the Co-operation of the Female, is what is now ſo generally agreed, that, I think, I need not here go about to prove it. However for the Satisfaction of ſome I ſhall mention one Inſtance in the moſt minute of theſe Inſects, which I ſhall take from the curious Obſervations of Dr. *Derham*, who aſſures us that he has, by a Microſcope, obſerved thoſe Animalcules on the Waters, not viſible to an unaſſiſted Eye, 100 of which at leaſt he has ſeen on a Drop of Water no bigger than a Pin's Head, and theſe, he affirms, 'that in *May* and *June* he has ſeen 'them very venereous, friſking and catching at 'one another, and many of them conjoined 'Tail

'Tail to Tail, with their Bellies inclined to 'one another.'

So that it appears that both Vegetables and Animals have their Productions from their Parent Vegetables or Animals, and are not any of them generated by the Heat of the Sun, upon Putrifaction and Corruption; as has been imagin'd by ſome ancient Philoſophers.

§. 10. But as few of theſe Kinds are capable of bearing the Cold of Winter, or then to act in their common Ways of Life; what admirable Proviſions are all of them enabled to make for themſelves in the ſureſt Ways and beſt Manners, which ſuit with their own Preſervations and thoſe of their Product.

I ſhall conclude this with an Inſtance of my own Obſervation. In the Country Village, were I received my Birth and Education; and have ſpent the greateſt Part of my paſt Life. I had an old Willow-Tree, which grew before the Front of my Houſe, which for ſeveral Years had been decaying in the Body; but ſome Life remaining in the Outſide and Bark, the Branches were preſerved to put on a Summer's Livery of green Leaves: But the Heart in the Body, being decayed, obliged it at laſt to yield and give Way to the Violence of a Winter's Tempeſt, which quite broke it off from the Root: It then being of no further Uſe but for Fewel, I cauſed it to be cloven up for that Purpoſe, when to the Wonder of myſelf and all

Specta-

Spectators, we found Multitudes of ſmall, ſtraight, round Hollows from the Top of the Bole to the Bottom, about the Proportion of the Hollow of a large Gooſe Quill, or perhaps, ſomething more; theſe Hollows lay very near to one another, throughout the decayed Parts; but I did not perceive that any of them interfered, croſſed, or claſhed one with another; and each of theſe Hollows were filled with as many Fleſh Flies as could poſſibly crowd into them; all of them lay, it is true, in an inactive and motionleſs State; but would revive by the Heat of the Fire: Whether they were capable or not of ſeeking further Security, I had no Opportunity to diſcover.

The Conclusion.

As to the Services theſe Tribes of Inſects are to Mankind we are told, that their Uſes are excellent in various medicinal Preparations; but thoſe, who have a Mind to enquire more narrowly into their ſecret Qualities, I refer to the Phyſicians.

I have before taken Notice of the particular Services of ſuch Bees as are kept in Hives; I may farther obſerve, that the ſweet and melodious Buzzings, or Huzzas, as it were, of theſe, and many others of the winged Tribes of them, do by a Kind of ſweet muſical Notes, invite us to the Praiſes of God for the Bleſſings beſtowed on us, ſince they, with the greateſt Satisfaction,

tisfaction, expreſs their Joy and Gratitude for this Seaſon of Life and Action, whereby they have been enabled to be made Partakers of ſuch a comfortable Share of Vigour as to exerciſe their Induſtry and Diligence in a timely Proviſion for the ſucceeding Winter; and this with Chearfulneſs and Alacrity they as gladly purſue in the moſt commodious Methods, that Wiſdom could, in common, well deviſe.

Here are Inſtances worthy of our Imitation, to excite us to Induſtry, Vigilance, and Care, that we waſte not our Time in unprofitable Trifles, nor neglect, in the Spring of our Youth and Summer of our Manhood, to gather Honey for our Support in the Winter of old Age.

'Tis certain the Caſualties of all Human Affairs render us liable to Misfortunes, and tho' we may lay up Proviſions for the Winter of Old Age, yet we are not aſſured, but that we may be robbed, cheated or defrauded out of them; and be ſent again to provide for Winter, even when it is near approaching: But allowing this, yet it is certainly moſt prudent to provide for Age; and if we have not, thro' Idleneſs or ill Husbandry, brought Want upon ourſelves, we are certainly entitled to Compaſſion and Relief from the Proſperous, and may juſtly deſire it, when the Idle, Indolent, or Profligate, who have brought their Wants upon themſelves, thro' their own Idleneſs, may and ought to be diſregarded.

Juſt as the Maſter of the Bees, when he expected Honey, had he, thro' their Indolence, found his Expectation fruſtrated, would have had no Regard to their Winter's Want, or have pitied their Diſtreſs.

CHAP. XIX.

Of REPTILES.

§. 1. MANY of the Obſervations which I have made of other Animals may be fitly applied to theſe; as their different Kinds, and Sizes, their Intelligence, Care of their Young, Proviſions and Securities againſt Winter, and the like; I ſhall therefore only take Notice of ſome Peculiarities concerning them, ſuch as of their Make, Shape, Motion; and the venomous Qualities of ſome of them.

§. 2. Their Make and Shape is generally long; they are thickeſt towards the Head, and gradually decreaſe to the Tail; they generally move upon their Bellies, and are moſt of them without Legs or Feet; ſuch as have any, have generally a Multiplicity of very ſmall ones; by which, ſays Dr. *Derham*, 'They move themſelves in a Manner not eaſy to be deſcribed in 'Words, ſo that their Legs in going make a 'kind of Undulation, and give the Body a ſwifter

'ſwifter Progreſſion than one would imagine 'it ſhould have, where ſo many Feet are to 'take ſo many ſhort Steps.'

Thoſe, which have no Feet move by many Geometrical Turnings and Windings, by the Strength and contrary Make of their Muſcles, and Sinews, to thoſe of other Creatures, which give them a free Motion; ſo that they can turn and wind their Bodies at their Pleaſure: This again, Dr. *Derham* obſerves in the Motion of the Serpent Kind; where, he ſays,

'There is a great deal of geometrical Neat-'neſs and Nicety in the ſinuous Motion of 'Snakes, and other Serpents. For the aſſiſt-'ing in which Action, the annular Scales under 'their Bodies, are very remarkable, lying croſs 'the Belly contrary to what thoſe in the Back, 'and the reſt of the Body, do; alſo as the Edges 'of the foremoſt Scales lye over the Edges of 'their following Scales, from Head to Tail, ſo 'thoſe Edges run out a little beyond, or over 'their following Scales; ſo as that when each 'Scale is drawn back, or ſet a little upright 'by its Muſcle, the outer Edge thereof (or 'Foot it may be called) is raiſed alſo a little 'from the Body, to lay hold upon the Earth, 'and ſo promote and facilitate the Motion. 'This is what may be eaſily ſeen in the Slough, 'or Body of the Serpent Kind. But, ſays he, 'there is another admirable Piece of Mecha-'niſm, that my Antipathy to theſe Animals 'has prevented my prying into, and that is

'that every Scale hath a diſtinct Muſcle, one 'End of which is tacked to the middle of the 'Scale; the other to the upper Edge of its fol-'lowing Scale. This, ſays he, Dr. *Tyſon* found 'in the Rattle Snake, and I doubt not is in the 'whole Tribe.

§. 3. The laſt Thing I ſhall take Notice of in ſome of this Tribe is, that remarkable Poiſon with which many of them are ſtocked: This, in Vipers or Adders, lies in a Bag in the Gums, at the upper End of the Teeth, which are two, in the forepart of the Mouth; by the Bite of which, the Poiſon is infuſed, and unleſs the part bitten be preſently cut out, or ſome other Help be ſpeedily applied, the Poiſon is quickly convey'd thro' the Body, by the Circulation of the Blood, and Death unavoidably enſues.

INFERENCE.

This dangerous Evil we may look upon as a Scourge to reclaim and bring ſinful Man to Repentance, who made himſelf ſubject to accidental Detriments, and Dangers by his Diſobedience, and to puniſh him for loſing his Sovereign Authority over every Creature; ſince it was thro' the Effects that enſued upon Man's Diſobedience, that their poiſonous Qualities were firſt imbibed: Of which ſee my *Philoſophical Meditations*. Part. II. Sect. 2.

Yet

Yet notwithſtanding this Evil has attended Man's Diſobedience, 'tis alſo a Mercy to reclaim us, as well as a Scourge; ſince God intends our Good by Corrections; and, even, in this, has provided a Remedy in the moſt poiſonous of theſe Creatures; for they are alſo made of excellent Uſes to heal the Effects of their own Poiſons; and our Phyſicians tell us, that they are alſo (if rightly prepared) made moſt Medicinal in many dangerous and ſtubborn Diſeaſes. Thus we may admire the Mercies of our compaſſionate Creator, who procures us Remedies ſufficient both for Body and Soul, againſt thoſe Evils which our firſt Parents Diſobedience has involved us in, when we were not in a Capacity ourſelves to find out a Remedy for either.

The CONCLUSION.

And now, from this tranſient View, which I have taken of the Creation of the Heavens and the Earth; from their Non-exiſtence, Non-entity, or Non-materiality, together with their Formation afterwards, with the other Furniture fit for the Entertainment of Man: What ſhall we ſay or conclude, from theſe amazing Works, of the Author of them? Shall we not ſtand with incomprehenſible Surprize, and freely acknowledge, that we are loſt in Thought, and cannot frame any adequate Ideas of a *Power* ſo inſuperable, of a *Wiſdom* ſo immenſe, and of

a *Goodneſs* ſo immeaſurable? Into what can we reſolve all this Power, Wiſdom and Goodneſs, but into the incomprehenſible Properties of infinite neceſſary Self-exiſtence; exiſting without Cauſe or Original? (of which ſee the ſecond of my *Philoſophical Diſſertations*) In which Exiſtence nothing could be wanted that it was not poſſeſſed of, and therefore there muſt be that Power lodged in it, above our Comprehenſions, to do whatſoever was agreeable to Wiſdom and Goodneſs: But as finite Beings cannot comprehend or fathom the unſearchable Works of infinite Power and Wiſdom, ſo the moſt perfect created Beings muſt ever acknowledge God's Works unfathomable, after the greateſt Searches into them, that they are capable of making from all their Enquiries; ſo that they that make the greateſt Diſcoveries will have the greateſt Share of their Admiration raiſed, their Delights augmented, and their Praiſes excited.

And this, if we look no further than into the wonderful Make and Oeconomy of this little Globe of our own: Little indeed! in Compariſon of the Magnitudes and unknown Numbers of other Globes, *&c.* of the whole Creation, when even to ſeveral Globes of our own Solar Syſtem, as *Saturn* and *Jupiter*, with their Satellites, our Globe becomes an undiſtinguiſhable Point! yet, I ſay, how wonderfully is this ſmall Globe made and provided for by admirable Furniture? What vaſt Varieties of Proviſions

viſions are here prepared for the Uſe and Service of Man before his being made and placed on the Earth? Firſt comfortable Lights are prepared, Days and Nights divided; then Trees, Fruits, Herbs, Vegetables, neceſſary for his Delights and Subſiſtence; and after this, almoſt an innumerable Retinue of various Kinds and Tribes of Animals, wherewith the Seas, Air, and Earth were furniſhed, all waiting for the Coming of Man to rule over, guide and govern them, and ready to congratulate his Coronation over them, with the utmoſt Pleaſure and Submiſſion.

Now, when this ſufficient Proviſion was made for Man, God determined this very Day to make Man, and to put him into the Poſſeſſion and Government of this new Fabrick thus fitted up, and thus furniſhed for his Reception.

CHAP. XX.

VERSES 26, 27, 28.

AND God ſaid, Let us make Man in our Image, after our Likeneſs, and let them have Dominion over the Fiſh of the Sea, and over the Fowl of the Air, and over the Cattle, and over all the Earth, and over every creeping Thing that creepeth upon the Earth.

So God created Man in his own Image, in the Image of God created he him, Male and Female created he them.

And God bleſſed them, and God ſaid unto them, Be fruitful and multiply, and repleniſh the Earth, and ſubdue it; and have Dominion over the Fiſh of the Sea, and over the Fowl of the Air, and ever every living Thing that moveth upon the Earth.

§. 1. It may be obſerved, that God in the whole Creation of Heaven and Earth before, together with their Furniture, commanded, *Let it be done*, and it was accordingly done: But here in the making of Man, God excites all the Powers of his Divine Eſſence, ſaying, *Let us make Man, in our Image*, &c.

Hereby ſignifying, that Man ſhould become his Repreſentative, whom he would endue with a divine Power and Authority over the whole Earth: Upon this Occaſion, God called upon all his divine Properties, or the Perſons of the ever bleſſed Trinity, in their diſtinct Offices, to the making of Man in the Image thereof; ſo that the making of Man was ſignally diſtinguiſhed by a more divine Influence, to be a Similitude of the Deity; to whoſe Authority, therefore, all other Animals, before created, being of inferior Intelligence, ſhould be ſubjected.

Thus the Image of God in Man was lodged in his ſuperior Reaſon and Underſtanding, and in a pure and holy Nature that ſhould know the

the Will of God perfectly; and could thereby govern the World juſtly, in Equity and Righteouſneſs; and uſe the whole Retinue of his Servants, as God deſigned them; not to be his Vaſſals and Slaves; but with ſuch Humanity, Compaſſion, and Tenderneſs, as would give them a true Pleaſure, Delight and Satisfaction in his Government of them, and render the whole a mutual and happy Society.

Now the Perſonal Offices of the Deity, being jointly concerned in the making of Man, Man was made a Being of the higheſt Intelligence; and, as the Repreſentative of his Maker, was diſtinguiſhed above all the Animals upon this Globe, tho' their modifyed material Bodies were pervaded with Life and Spirit, ſo as to make them capable of Self-motion and Action.

Man muſt therefore be a reaſonable Agent, whoſe Will ſhould be the Director of his Actions: To whoſe Will there was annexed a Power ſo to direct it, as either to preſerve himſelf in his Innocence and juſt Government, or (as equally) a Power to deviate from it.

For any deputed Governor, who repreſents a Superior muſt have a Truſt committed to him, in the Execution of which, while he is faithful in the Performance of the Terms enjoined, he continues the Similitude or Repreſentative of him, who committed ſuch Government to his Truſt; but if he ceaſes to repreſent him in Qualifications, and juſt Government; his Right of Government muſt devolve on the prime Gover-

nor

nor, and the Authority of the other muſt neceſſarily become void.

Thus Man, being made in the Image of the Holy Trinity, was a lively Repreſentative of the Divine Nature in all the perſonal Properties thereof, and therefore, in his ſpiritual Intelligence and Power, was a divine and holy Reſemblance of him, and an outward Repreſentative of his Authority.

And had Man continued to have preſerved this Image of his Maker, all his Subjects and Servants, ſent before him to attend upon him at his Coming, would have experienced, that they, with the whole Creation of this Globe's Furniture and Inhabitants, would have remained (as God pronounced them, upon his View of the Whole) all very Good.

But as the Eſtate of this Primitive Purity was ſoon loſt by Man's Tranſgreſſion, I ſhall only ſpeak of it here as it falls in with other Conſiderations; thoſe who deſire to ſee it diſtinctly conſider'd, may find it in the ſecond Part, and firſt Section of my *Philoſophical Meditations.*

I ſhall next take Notice of what may be obſerved of the Creation of Man, Male and Female.

In the 27th Verſe before rehearſed, we are told, that God created Man in his own Image; Male and Female created he them: In which is only a general Account of their being made Male and Female: But in the next Chapter, wherein

wherein is a kind of a Recapitulation of the Creation; in the 7th Verſe, *Moſes* more emphatically deſcribes the Manner how Man was made, which he tells us there, was of the *Duſt of the Ground*; and that when all the reſt of the Creatures, that were made before him, were brought to him, Verſe the 19th, That he gave them all Names, which, we may reaſonably believe, proceeded from that Underſtanding, which God had given him, of their Natures, and Properties, and were adapted to the proper Offices which he ſhould appoint to each of them.

§. 2. But notwithſtanding this vaſt Retinue, this numerous Attendance, God looked upon *Adam*, and he on himſelf, as yet *alone*: He being ſtill without an Help-meet for him: For there was not found amongſt them all, one as yet qualified to make him a ſociable Companion: For when *Adam* had viewed the whole Tribes of the Animal Creation, and found not amongſt them all, an Help-meet, or ſociable Companion, for him, it muſt, then, be very agreeable to *Adam* to receive ſuch an one, which, after his own Likeneſs, ſhould become ſuch an Help as was meet for him. —— Now to make an Help, meet for ſo intelligent a Being as God had made Man, whom he created in his own Image, and into whom he had breathed the Breath of Life, * to make the Obligation perpetually binding between

* Of this ſee my Journey thro' the World. Sect. 1.

between Man and Wife; God here again makes uſe of a quite different Method from that which had been before taken amongſt the Creation of any other Animals in making of Male and Female; ſince no Evils could ariſe from the random Propagations of the brutal Creation. But Man, whoſe tranſcendent Reaſon ſo far diſtinguiſhed him above them: The Male and Female of Mankind are deſigned, by as diſtinguiſhing a Characteriſtick, to be placed accordingly above the Brutal Creation; and that one Male and one Female ſhould be entirely, and only devoted to the peculiar Happineſs of each other; and to whom, and none elſe, they ſhould be as *One*; that there ſhould be no Infringments upon the Engagement of Matrimonial Contracts, as will hereafter appear: And, even now, ſuch Marriages bring the virtuous Pair to the neareſt Happineſs of an earthly Paradiſe as can be here attained.

§. 3. For tho', after Man's Degeneracy from his primitive Purity, it was allowed by the *Moſaic* Law, that Men might have more Wives than one, and alſo might divorce their Wives upon divers Occaſions of Offence; yet ſince the Appearance of the Son of God in the Fleſh, who came to reſtore Fallen Man, and to bring his Followers back to Obedience; I ſay, this Son of God plainly tells us, That *from the Beginning it was not ſo*, or that it was not ſo ordained in the original Deſign and Inſtitution of Mar-

Marriage between Man and Wife: And therefore to reſtore Marriage, as near as poſſible, to its original Purity, he forbids any Man to put away his Wife, and to marry another, except it be for Fornication; which we may obſerve by the Way, plainly imports that he ſhould not marry two at one Time, and this as plainly forbids Poligamy. Thus God, in making Man a Female Companion, uſes a Method, diſtinguiſhable from the reſt of the Animal Creation, and caſts him into a deep Sleep, takes out one of his Ribs, and from thence forms, and makes an Help-meet for him, being in his own Likeneſs, and as in *Adam*'s, ſo in God's: In *Adam*'s as Bone of his Bone, and Fleſh of his Fleſh; and in God's, as being of the ſame Intelligence, Reaſon, and Underſtanding with her Huſband, and therefore to have an equal Share in Government; thereby to become a proportionate Help-meet for him: For it is plain, ſhe only loſt her Equality with her Husband, by being firſt in the Tranſgreſſion; ſince Part of the Puniſhment pronounced againſt her for that very Cauſe, was, That her Husband ſhould rule over her; or that, as ſhe had proved the weaker Veſſel, ſhe ſhould become ſubject to him.

If then we will but a little reflect upon the State of Innocency between *Adam* and *Eve*, we may behold the Nature of a true conjugal State, which the nearer any Man and Wife can now imitate, the nearer to their primitive Happineſs they will arrive; and therefore all Mankind

kind have the ſtrongeſt Motives to prevail with them to make it their chief Purſuit: For they that purſue the contrary lay a Foundation for Diſorders and Confuſions, to attend them in all Concerns of this Life, and a laſting Diſſatisfaction of Mind throughout all the Scenes and Circumſtances of it.

§. 4. I appeal to all married Perſons; and firſt to thoſe, who have been, and are reſolved to continue faithful to their Engagements. Have you not experienced a certain ſecret Pleaſure in that joint and mutual Love which you bear to each other? Has not this inward Affection appeared like a Self-love, and produced a reciprocal Concern, and Deſire of a joint Self-preſervation? Could either of you ſuffer, and the other not feel the Effects? Was not the Happineſs or Miſeries of the one, the Happineſs or Miſeries of the other? Were not your Conſultations for the beſt, and your Concerns mutually joined in both temporal and ſpiritual Affairs for yourſelves and your beloved Iſſue? And does not a ſecret Pleaſure and Satisfaction ariſe to you Both, from this conſtant Fidelity in ſo delightful a Harmony? Are not your mutual Embraces compoſed, and ſatisfactory? and does not the very After-thoughts of the Taſtes of them raiſe a continual Reliſh, and leave a ſweet entertaining Senſe thereof upon the Mind of every Couple thus happily united? One would imagine, that the Advantages flowing from

from theſe Duties, even, in this Life, would be the ſtrongeſt Obligation upon all Men and Women to purſue ſuch pleaſing, ſuch beneficial, ſuch ſatisfactory Duties, from which ſo much Comfort and Happineſs will certainly ariſe; and as great a Degree of primitive Purity and Pleaſure will be thereby recovered, as is poſſible to be attained in this State: Nay, all Men are ready to acknowledge, that ſuch a State is the next Repoſe to Heaven itſelf, and therefore the neareſt like that of *Adam* and *Eve* in their primitive Paradiſe.

But the contrary, and oppoſite Evils, muſt purſue thoſe who relinquiſh their Obligations to ſuch inviting Duties, and they who have deviated from true Conſtancy muſt thereby, of Conſequence, loſe the united Affections of each other: And now let me ask *you*, Have you not experienced an inward Pain and Horror, and a terrifying Bitterneſs always attending it? Has not your random Looſeneſs been always ſucceeded with Confuſions and Diſorders of Mind, and ſometimes with Diſeaſes of Body? Was not Confuſion the End and Concluſion of both Parties concerned in theſe unlawful Intrigues?

But why ſhould I ſtep aſide into the Mud, and tread in ſuch Filth? Let him that is clear, keep from Spots of this Nature, (ſince all Men pretend to purſue their own Happineſs) and he that is ſpotted, let him break off from his Vice, and endeavour to rub out his Stains as well as

he

he can, tho' he will find it difficult totally to eraſe Stains of this Nature.

The Propagation of Mankind was never deſigned to proceed from random Acts, but, to be performed by one Male and one Female, united in Contract, and in inviolable laſting Fidelity, and this of perfect Choice and Conſent, as firmly eſtabliſhed, as that of *Adam*'s receiving of *Eve* (when there was not found in the World, beſides her, an Help-meet for him) with the ſtrongeſt Affection, which he profeſſes for her, by breaking forth with Joy and Pleaſure, into that rapturous Expreſſion, *She is Bone of my Bone, and Fleſh of my Fleſh*; and ſo received her as what completed himſelf.

And this tranſporting Pleaſure every honeſt Man and Woman muſt feel who are thus engaged in true conjugal Affections, and do not depart from their Engagements with each other: Theſe, notwithſtanding the Multitudes of others of the ſame Species, bind themſelves to thoſe only with whom they thus firſt contracted; their Union is ſo inviolably firm, and binding, ſo inexpreſſibly affecting, and cloſely engaging, that from their firſt Entrance into them, it would be impoſſible for them, in the whole World beſides, to find out an Help meet. —— And this the very Law in Nature, or the very Nature of Things has firmly eſtabliſhed in the Conſequences attending the contrary: But where Contract between Man and Wife is faithfully kept, it gives them ſuch Tranquility,

quility, that will, at leaſt, allay all thoſe accidental Grievances, that, in this relapſed State, do attend upon all Men in common.

But all accidental Grievances, befalling the other, are doubled and trebled by inteſtine Confuſions and Diſorders, ariſing from contrary Practices.

If, then, the Happineſs of this Life ſo far conſiſts in an happy Union, and in an inviolable Fidelity between Man and Wife; ſo that all accidental Grievances are thereby much allayed and abated: How ſweet muſt thoſe Enjoyments be, in a pure State, where no accidental Diſturbances could ever break in to diſcommode them?

On the contrary, How bitter muſt it be, where neither Union, Loyalty, Truth, nor Conſtancy, remains between them? Then no State of Life is ſcarcely tolerable; Grievances become inſupportable; Life burdenſome, every Thing perplexing; and the very Flames of Hell are breaking forth upon them.

By the Remarks, which I am ſometimes led into to make on the Confuſions attending ill Practices, I only mean to illuſtrate the firſt State of Purity, thereby to excite all Men to endeavour after the Recovery of it as far as they can here, and to which we have a ſtill more binding Encouragement, ſince we are hereby entitled to a more complete and full Happineſs; which God has by a merciful Redemption prepared for all the Sons of *Adam*,

who will not, by a wilful Diſobedience, ruin themſelves.

For as Paradiſe was loſt by Tranſgreſſion; ſo, even in this Life, the more we ſtrive after Holineſs and Obedience, by this Redemption, we are the more entitled, and made more capable of enjoying inward Peace, Satisfaction, and a calm and ſerene Spirit; and ſo much as we here enjoy of that, ſo much of the Happineſs of Paradiſe we here retrieve: But thoſe, who encreaſe their Guilt by wilful Diſobedience; and, as ſome vile Miſcreants have done, glory in their Shame; theſe ſink themſelves into the Gulph of all Miſeries preſent, and to come, being, it is to be feared, irreclaimably loſt to all Senſe of Remorſe.

Observation.

§. 5. The Creation of Man was not looked upon complete before they were made Male and Female; nor was *Adam* more than one Part of himſelf, till his Help-meet for him was provided, and delivered to him, ſo that as God is firſt ſaid *to create Man in his own Image*, it is repeated, *In the Image of God created he him*; and then it is ſubjoined, *Male and Female created he them.*

So that when *Adam* received his Wife he became completely finiſhed in Male and Female, as it is expreſſed in the 27th Verſe, before recited.

cited. *So God created Man in his own Image, in the Image of God created he him, Male and Female created he them.*

This ſhews the completing of Man's Creation in Male and Female; and the Manner in which it was performed is ſhewn in the Recapitulation thereof, before obſerved, from the 21. and 22. Verſes of the ſecond Chapter.

Both which we ſhould have an Eye to; and we may obſerve, that in the Creation of other Animals, there is no Accounts of the Females being taken from the Males; and therefore no Occaſion, amongſt them, for thoſe Ties and Contracts of a conſtant Union in one Male and Female to be entirely knit together; for their inferior Reaſon could lay no ſuch Obligations and Conſtraints upon them, as Man's ſuperior Reaſon muſt do upon him: For Man, who was made the ſupreme Governor and Head of the Whole; his ſuperior Reaſon and Intelligence muſt inſtruct him to act in a more ſublime, different, and reaſonable Manner; and agreeable to that Divine Image in which he was created, and in which were Perfection and Union; ſo that *Man* was not deſigned to ſtoop ſo low as to act in this Matter in the Manner of the brutal Creation, thereby to level his Dignity and Authority with his inferior Subjects.

And, no doubt, had *Adam*, and his eſpouſed Conſort, (whom he called *Chavah* or *Eve*, from her being the Mother of all Living) continued in their primitive Purity, there would never

have been any Deviation from the firſt Law imprinted on Man's future Matrimonial Contracts.

So that, as I ſaid before, they, who now keep theſe Contracts inviolably, do certainly come the neareſt to a paradiſaical primitive Happineſs, notwithſtanding the counter Occurrences of other accidental Misfortunes.

How happy then muſt that Couple be, who have all the Comforts of this Life ſuper-added?

And this Conſtancy indeed, is the moſt likely to procure all other Comforts of this Life, where they are wanted; for as the contrary deſtroys them where they would otherwiſe be; ſo where they are wanted, Prudence, Induſtry, and Diligence, which are generally Concomitants with true Love and Loyalty, commonly overcome the Frowns of the World, or at leaſt procure a ſenſible Bleſſing, ſomething reſembling that of Paradiſe.

And who would not do all that lies in his Power to retrieve that Happineſs as much as poſſible? Let none blame *Adam*, but themſelves, that for Sloth will not endeavour after it: For it is plain and viſible before all Men's Eyes, that their preſent Welfare depends upon Endeavours after it; to which we may alſo ſubjoin our Views of future Deliverances from eternal Shame and Confuſion.

§. 6. Now when God had created Man, Male and Female, *he bleſſed them*, and ſaid unto

to them, *Be fruitful and multiply, and replenish the Earth; and ſubdue it*, &c.

In this Bleſſing, God gave them a Power and Inclination, to be fruitful and multiply, and thereto annexed a Command to perform their Power and Inclination: For this was the chief Reaſon that God made an Help meet for *Adam*, in which he was not only to enjoy all other Advantages of this Help-meet; but hereby ſhould alſo propagate his Species, which Act was not only enjoined as a Duty, but the very Performance of the Duty, (as Obedience to all God's Commands carry their Rewards along with them) was made one of the greateſt Pleaſures ariſing to the bodily Senſations, giving a Sweetneſs to the Command, and this added to all other Advantages, completes his Paradiſaical Happineſs.

And what could a benevolent Creator do more than thus unite Duty and Happineſs, by making the very Duty enjoined both the Pleaſure and Happineſs of thoſe to whom he enjoined it?

It plainly then appears to be a Duty enjoined to *Adam* and *Eve* in their primitive Purity, To be fruitful and multiply, therefore the Notion amongſt ſome, that *Adam* and *Eve*'s Act of Propagation was their Tranſgreſſion or Fall, muſt needs be falſe and abſurd; of which I have taken Notice in the firſt Section of my *Journey through the World*, to which I refer you. But this is ſo very obvious that I won-

der how any ſhould run into ſo obvious an Error; when to be fruitful and multiply, in his primitive Purity was made his very Duty; even, upon the very Formation, and Delivery of *Eve* to him, as an Help-meet for him, that he might thereby repleniſh the Earth, and ſubdue it; and have Dominion over the Fiſh of the Sea, &c.

Here is alſo the ſole Government of every Creature, and all the whole Furniture of the Globe put into his, and, in him, into his Poſterity's Poſſeſſion, as being all made ſubject to him, and at his proper Diſpoſal: For as he was created in the Image of his Maker, he was made his Repreſentative, and his Government muſt therefore neceſſarily be agreeable to his Juſtice, Goodneſs and Holineſs, and agreeably thereto, he muſt rule in perfect Love and Mercy: He muſt therefore, then, be a juſt Governor, and make his Subjects happy under him; whoſe Pleaſure it would be to be governed by him, ſince his Government could never tend to any Thing but the Happineſs of the whole Inhabitants of the Globe.

As to what Manner, and after what Form he was, in that State, to have governed them, and what Services he might appoint them, we cannot determine, but can only judge, in the general, that they would have been ſuch as every Species were qualified for, and would with Pleaſure perform.

But

But ſince Man, by Tranſgreſſion has defaced the Image of God in himſelf, which gave him this ſole Power and Dominion over the whole Globe and Inhabitants, he has ſo far loſt the Command of the Creatures, that ſome, who have a ſuperior Strength do often reſiſt his Authority, and can now only, by Stratagems be brought over to his Services, which now alſo very often prove Slaveries: This however was not the original Deſign of Man's Government of the whole Globe and Inhabitants; I ſay, he was not deſigned to be a tyranical arbitrary Governor, to enſlave his Subjects, and to reduce them to Vanity and Miſeries, but to preſerve them in Peace and Tranquility, Concord, and Unity, according to the different Degrees and Capacities of every Individual, which would have preſerved the whole in Subjection, and have been an entire Barrier againſt the leaſt Appearances of any Rebellion; for then Man would have reigned in the Affections of his Subjects, which would, with Gladneſs, have confined them to his juſt Government, more than all the Stratagems that can be deviſed, or all the Acts of arbitrary Power will ever be able to ſtand in the leaſt Competition with.

CHAP. XXI.

Verses 29, 30, 31.

AND God said, Behold, I have given you every Herb bearing Seed, which is upon the Face of all the Earth, and every Tree, in the which is the Fruit of a Tree yielding Seed; to you it shall be for Meat.

And to every Beast of the Earth, and every Fowl of the Air, and to every Thing that creepeth upon the Earth, wherein there is Life, I have given every green Herb for Meat: And it was so.

And God saw every Thing that he had made, and behold, it was very Good: And the Evening and the Morning were the Sixth Day.

§. 1. Now when God had thus finished, not only the Creation of Heaven and Earth, with Fruit-Trees, Vegetables, &c. and had also stocked the Globe with Animals in vast Varieties both of Kinds and Tribes; and last of all made and set over them a Governor, whose Coronation they joyfully celebrated; then it was that God appropriated to each their proper Food, before provided in Plenty, such as was every Way properly adapted to every different Palate,

and

and made agreeable to the differently proportioned Conſtitutions of every Kind.

To Man God appoints every Herb bearing Seed, and every Fruit of Trees, except of the Tree of Knowledge of Good and Evil.

And to the Beaſts, Fowls, and creeping Things, he appoints every green Herb, as Graſs, &c. to which Sorts their acute Palates ſhould be directed by their Senſations; ſo that each might partake thereof to their Satisfaction according to their different liking.

For of theſe Things God had provided very plentifully, and in ſufficient Variety, that there was not, in this pure Eſtate, any Occaſion for any one Creature whatſoever to make a Prey of another, as is now the conſtant Practice of the greateſt Part of the Animal Creation.

For tho' we are not here acquainted with what Food was aſſigned to the Watery Inhabitants, yet we may reaſonably conclude, that they alſo would be well provided for; and that then, not any one Species of Animals were obliged to make Preys of another; no, not upon the firſt Change that ſucceeded Man's Diſobedience; nor till the Changes, that ſucceeded the Deluge brought a further Shock upon the Order of Nature. On which Changes I have pretty largely expatiated in the 2d Vol. of my *Philoſophical Meditations*, Sections 2, and 3, to which I refer you; and ſhall from hence make ſome occaſional Obſervations.

OBSER-

Observation 1.

Hence it is plain, that Man and Beast, even the whole Animal Creation were to subsist by Food; then must Man as well as Beast have a material Body to be nourished by it: For if *Adam* and *Eve* had had only spiritual Bodies, such as our Bodies will be at the Resurrection, then they could not have been designed to live by eating: Nor without material Bodies could they have become fruitful in the Propagation of their Species; for our Blessed Saviour expressly tells us, that we shall *not* in our spiritual Bodies, which, a divine Writer of mystical Divinity would persuade us, will be no other, than *Adam*'s primitive paradisaical Body was: But it appears, that in a future State, *there will be neither marrying nor giving in Marriage, but they will be as the Angels of God*; and therefore, then, no Distinctions of Male and Female: But here they were created Male and Female for the very Design of Propagation, and appointed Food proper for the Nourishment of their terrestrial Bodies, from which Food Bodies celestial can receive no Nourishment.

Adam likewise is said to be made of the Dust of the Ground, and *Eve* of one of his Ribs; and was called by himself *Bone of his Bone, and Flesh of his Flesh*: By what Allegory then this can be proved to shew that Man was not made

made at first of natural Flesh and Bones, I am not able, even tho' a Mystery, to discover.

For if this is allegorical, then *Herbs, Fruits, Dust of the Ground, Bone,* and *Flesh* must all be taken allegorically together: But what will this lead to? — Even to confirm some in their wild Notions, that all such Things as our Senses represent unto us are only Ideal, and that there is no such Thing as real Matter in the World: For this Notion must be near a-kin to that of those Dreamers, who imagine and peremptorily affirm it for a *great Truth*, That *Adam*'s Body before his Transgression was not a natural or earthly Body, but a spiritual Body, and that his Transgression sunk it into an earthly Body; but, if so, then before his Transgression, the Fruits appointed and allowed him for Meat could not be natural, but spiritual, since natural Fruits could not support or nourish a spiritual Body. — 'Howbeit that was, not first which is spiritual, but that 'which is natural, and afterwards that which 'is spiritual.' — But by this mystical Divinity we are taught the contrary, *viz.* That, that was not first which is natural, but that which is spiritual, and afterwards that which is natural. But,

Supposing the Trees and Fruits before *Adam*'s Fall could not be really material, but ideal, and his eating of them be so likewise, and that, by his ideal eating of one Fruit, all the

the reſt together with his own Body, *&c.* became really Material.

Yet if the Beaſts had really Material Bodies, as theſe Divines allow, and were to ſubſiſt by eating Material Herbs, and Graſs; then *Adam*, who was allowed the Fruits of all manner of Trees, one only excepted, as well as his Choice of Herbs; it muſt neceſſarily *ſeem* to be a *Great Truth*, That *Adam* had a Material Body as well as his Fellow Animals, tho' ſuperior in his Make, as well as diſtinguiſhed in his Shape and Circumſtances, as alſo in ſome Preſcriptions of his Food.

Whatever Alterations enſued in the Beauty eſtabliſhed firſt in Nature, it could not proceed from *Adam*'s being firſt made a Spiritual Body, and by his Diſobedience ſunk into an Earthly One; ſo as to require Material Lights and Food, which before he could have no Occaſion for, but thereby the Fruits, he was to partake of, became Material, which before there could be no Occaſion, to him, for their Materiality; nor could he, in ſuch a State, have had Occaſion for the luminous Rays proceeding from the Material Body of the Sun: For then both Fruit Trees, their Fruits; the Sun, and its Light had all been created in vain, as to any Uſes flowing from them to *Adam*, except he tranſgreſſed to make them become uſeful.

But allowing theſe to be material before his Body, then I would aſk by what Light did he converſe with the material Creatures, and by what

what Knowledge did he give them all Names? Why were they all created before him, if not for his Service and Attendance? And how could Spiritual Eyes diſcern, and Spiritual Intelligence converſe with Material Objects in ſo familiar and ſynonimous a Way?

If *Adam* had had only a Spiritual Body, his Spiritual Intelligence could only have beheld Things in a Spiritual Manner; and what Communion could there then have been between him and his Fellow Creatures? He would have ſeen by a Spiritual Light, and they thro' the Organs of their bodily Senſes, by a Temporal One. What Need then was there for the Uſe of Sun, Moon, and Stars, for Man, which were firſt created for his Uſe and Service? For in his future State he will have no *Need of Sun, Moon, or Candle*; but they were created for his preſent State to divide Nights and Days; and to be for Signs and for Seaſons, and Days and Years, which are entirely uſeleſs to Spiritual Bodies: Or what need ſuch numerous Servants be created to attend his Coming, when both the one and the other, would have been, in ſuch a State entirely needleſs to him, the ſame as they would be, in their preſent Circumſtances in his Reſurrection State: Which is the State in which theſe Myſtical Divines imagine *Adam* to be firſt created: But that our State after the Reſurrection, will raiſe us, by the Redemption of Jeſus Chriſt, far above our Creation State, I think, I have proved in my former Works, particularly in my *Chriſtian Philoſopher*.

OBS.

Obs. II. If *Adam*'s Body had been created Spiritual, how comes he to become a living Soul by receiving the *Breath of Life?* Spiritual Bodies have no Occaſion to receive and return the Air, which Material Bodies pervaded with Spirit muſt have, to continue the Union of Body and Soul; which Air is requiſite in ſuch a Body to ſupport that Union, and is therefore beſtowed on all Animals in neceſſary Proportions, and upon Man with the additional Image of the Holy Trinity into the Intellectual Faculties.

But, as before obſerved, if *Adam*'s Body had been only Spiritual, then he could not have been Partaker of Earthly and Material Fruits, no more than a Body after the Reſurrection can, and it muſt be abſurd to imagine that any Fruits are Spiritual, ſince it is as bad as to imagine them Ideal; and a Spiritual Intelligent Being, not cloathed with a Material Body, would not want Ideal Fruits to feed his Fancy with.

If the Fruits had been Ideal, that were aſſign'd to *Adam*'s Eating, then likewiſe muſt the Herbs be of the ſame Kind, and have no Materiality in them; for *Adam* was alſo allow'd his Choice of Herbs, which were alſo appointed to the Beaſts, Fowls and creeping Things, ſo that if one was Ideal, they muſt all be Ideal together, and ſo prove the Brutal Creation itſelf ſo, and therefore either all ſunk into Materiality together, or elſe into an imaginary Notion of it; which,

which, by the Deception of our Senſes, perſwades us that we are what we are not. But this, I truſt, few will contend for, the very Mention of it, to all Men in their Senſes, ſhewing its Abſurdity.

OBS. III. If God could not create Matter from Non-exiſtency (as, I think, I have proved he did in my Diſcourſe upon the firſt Verſe) but it muſt ariſe from the Ruins of an Angelical World, then this Angelical World before, muſt be an Immaterial and Spiritual World, and have only Immaterial and Spiritual Inhabitants, but by their Diſobedience their Angelical World was ruined, from which Ruins a Material World ſprung up; but if their World could be thus changed from Immateriality into Materiality (as is likewiſe aſſerted by the ſaid Writer of Myſtical Divinity) by the Tranſgreſſion of theſe Spiritual Inhabitants; how came it to paſs then, that their Diſobedience had not the ſame Effect upon their own Spiritual Natures, and did not ſink them into ugly deformed and material Bodies, even, ſuch as ſome do in Pictures repreſent them? For if *Adam* was cloath'd with a Body of Fleſh thro' his Tranſgreſſion, how came they to change their World into Matter by Tranſgreſſion, aud yet eſcape being cloathed themſelves with the groſſeſt Part of it?

For, if their angelical World had been ſunk into a material one by their Fall, then certainly their ſpiritual Natures would have been ſunk into

into ſuch as are material along with it; ſince, if it would have had ſuch an Effect upon their World, or the UBI of their Exiſtence, their own Natures muſt have been Partakers of the Effect, as being the Efficient Cauſe: For if ſuch Cauſes will neceſſarily produce ſuch Effects, the Effects muſt of Neceſſity immediately enſue the Exiſtence of the Cauſe. So that if their Diſobedience would neceſſarily have ſunk the Nature of their angelical World into groſs Matter; the very ſame Cauſe would have ſunk their ſpiritual Natures into material ones; nor could they, in ſuch a Caſe, have been reſerved (if that Cauſe would have produced that Effect) to have been hereafter cloathed with material Bodies by Means of lineal Generation.

Tho' this wild Notion alſo has been zealouſly propagated by ſome, that the fallen Angels are ſent to enter into and pervade material Bodies in the Womb; yet if that was Fact, then muſt *Adam*'s and *Eve*'s Souls likewiſe be inſtilled in the ſame manner into their Bodies, which would make Men and Women a Race originally ſprung from Devils, inſtead of being created in the Image of God. But this Abſurdity, I think, I have ſufficiently confuted in the firſt Sect. of my *Journey through the World.*

Obs. IV. Indeed they who would endeavour to prove it impoſſible for God to create Matter out of Nothing, have diſcovered a Way (ſuch as it is)

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to help him to ſomething (I know not what) to produce it from: But that, if allowed, would prove that it was not God, that made this material Globe as it was upon this Creation, but the Wickedneſs of the fallen Angels; even, the Devils by Sin! —— I cannot help the ſad Conſequences, that the Notions of myſtical (or rather whimſical) Divinity lead even ſome pious Men into.

But, could it, or had it ſprung from thence it would not have been as God pronounced it, when he beheld the whole of this Creation, and declared that every Thing was very Good: Which could not have been the Reſult of a material World ſprung from Diſobedience, or the Work of the Devil; nor could it have been a fit Habitation for Beings created pure, with the Image of the ever bleſſed Trinity enſtamped upon them.

From theſe Obſervations, on theſe lately exhibited Notions, under the Term of Myſtical Divinity, I ſhall take the Liberty to deduce a few Corollaries.

COROLLARY I.

I am ſorry to find ſuch Notions propagated by one, who has gained a general Veneration and Eſteem as a learned and very pious Man: But neither Learning nor Piety ought to give a Sanction to what carries along with it ſuch manifeſt Abſurdities, which are contrary both

to Scripture and Reaſon; and therefore to put them off had need of the Cloathing of Myſtical Divinity; but if we take away the Miſt, we may hope to ſee clearer.

Corollary II.

Notwithſtanding the Pretenſions of the Spirit's Inſpirations upon *Jacob Behemen*, from whom the Rev. Mr. *Law* profeſſes he had theſe Notions at firſt, yet this Inſpiration, if it be found to lead to a manifeſt Error, can never come from the Spirit of God; but from a whimſical Spirit, ſuch as inſpired *James Reeve*, and *Ludowick Muggleton*; and *Lacy* with his Followers in their Spirit of Prophecy, whereby they uttered the Warnings of the eternal Spirit in Queen *Anne*'s Time.

Corollary III.

The Scriptures are a ſtanding Revelation of God's Will delivered to the World, by the inconteſtable Authority of Miracles beyond all Power but Divine, and there can now be no ſuch Thing expected as abſolute or immediate Inſpiration in further Diſcoveries of God's Will by myſtical Interpretations of the Scriptures: I own every impartial Enquirer has a Right from God's Promiſe, to the Influence and Direction of his Holy Spirit in his Searches into the Scriptures, and may expect it, as far as he directs

directs his Searches impartially, and every Man has the ſame Right, upon the ſame Foundation, to judge of ſuch Interpretations or Conſtructions as any Authors put upon them. The Freedom of which Liberty I aſſume, and can aſſure myſelf, and therefore my Readers, that under this Direction, I endeavour to qualify myſelf to appear an uſeful Member of Chriſt.

Well! but theſe Pretenders to Inſpiration will readily allow, that the Scriptures of the Old and New Teſtaments are the ſtanding Revelations of God's Will: But then, ſay they, we are inſpired with a new Interpretation of them, whereby to open their Myſteries, that have lain concealed; and when they have firſt perſuaded themſelves, by ſome whimſical Notions, raiſed in their own Minds, either by ſome Imaginations of their own Brains; or thro' the Suggeſtions of ſome Spirit not divinely commiſſioned, they fondly embrace the Deluſion, and induſtriouſly propagate it for Inſpiration.

And, we find that all Ages have been furniſhed with ſuch Enthuſiaſts; and that few of them have been without their Followers and Admirers; of which ſome of the Sects amongſt us are ſtanding Witneſſes; and they, who have admired and followed one, have been deſpiſed by ſome of thoſe, who have admired and followed another.

COROLLARY IV.

As all Chriſtian Ages have had Upſtarts of this kind, ſo do theſe very Days furniſh us with ſtrenuous Pretenders to divine Inſpirations; but if we try and examine the Spirit by which they are led, ſhall we not have Reaſon to conclude, that their Outcries are whimſical, and not directed by the Spirit of God and Truth; ſince there is nothing in them that can recommend them to be embraced by impartial Reaſon upon ſtrict Enquiry?

§. 2. The diſcerning Mr. *Lock*, in his Second Vol. of *Human Underſtanding*, makes Obſervations on the Reaſons of Enthuſiaſm; which, I think, it is very well worth our Notice, and therefore I ſhall from thence tranſcribe ſome of his Paragraphs, as being agreeable to the Subject, and what puts the Matter in a clear Light.

'Immediate Revelation, ſays he, being a 'much eaſier Way for Men to eſtabliſh their 'Opinions, and regulate their Conduct, than 'the tedious and not always ſucceſsful Labour 'of ſtrict Reaſoning, it is no Wonder that ſome 'have been very apt to pretend to Revelation, 'and to perſuade themſelves that they are under 'the peculiar Guidance of Heaven in their Actions and Opinions, eſpecially thoſe of them 'that they cannot account for by the ordinary 'Methods of Knowledge, and Principles of 'Reaſon. Hence we ſee that in all Ages, Men, in

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'whom Melancholly has mixed with Devotion, 'or whoſe Conceit of themſelves has raiſed 'them into an Opinion of a greater Familia- 'rity with God, and a nearer Admittance to 'his Favour, than is afforded to others, have 'often flattered themſelves with a Perſuaſion of 'an immediate Intercourſe with the Deity, and 'frequent Communications from the Divine 'Spirit. God, I know cannot be denied to be 'able to enlighten the Underſtanding by a Ray 'darted into the Mind immediately from the 'Fountain of Light. This they underſtand he 'has promiſed to do, and who then has ſo 'good a Title to expect it, as thoſe, who are 'his peculiar People, choſen by him and de- 'pending on him.

'Their Minds being thus prepared, whate- 'ver groundleſs Opinion comes to ſettle itſelf 'ſtrongly on their Fancies, is an Illumination 'from the Spirit of God, and preſently of Di- 'vine Authority; and whatſoever odd Action 'they find in themſelves a ſtrong Inclination to 'do, that Impulſe is concluded to be a Call or 'Direction from Heaven, and muſt be obeyed; 'tis a Commiſſion from above, and they can- 'not err in executing it.

'This, ſays he, I take to be properly Enthu- 'ſiaſm, which tho' not founded on Reaſon 'nor Divine Revelation, but riſing from the 'Conceits of a warmed or overweening Brain, 'works yet, where it once gets footing, more 'powerfully upon the Perſuaſions and Actions

'of Men, than either Reaſon or Revelation, or 'both together: Men being moſt forwardly 'obedient to the Impulſes they receive from 'themſelves; and the whole Man is ſure to act 'more vigourouſly where the whole Man is 'carried by a natural Motion. For ſtrong Con-'ceit, like a new Principle carries all eaſily 'with it when got above common Senſe, and 'freed from all Reſtraint of Reaſon, and Check 'of Reflection, it is heightned into Divine Au-'thority in Concurrence with our own Temper 'and Inclination.

'Tho' the odd Opinions and extravagant 'Actions Enthuſiaſm has run Men into, were 'enough to warn Men againſt this wrong Prin-'ciple ſo apt to miſguide them, both in their 'Belief and Conduct; yet the Love of ſome-'thing extraordinary, the Eaſe and Glory it is 'to be inſpired, and to be above the common 'and natural Ways of Knowledge, ſo flatters 'many Men's Lazineſs, Ignorance and Vanity, 'that when once they are got into the Way 'of immediate Revelation, of Illumination 'without Search, and of Certainty without 'Proof, and without Examination, 'tis a hard 'Matter to get them out of it. Reaſon is loſt 'upon them, they are above it: They ſee the 'Light infuſed into their Underſtandings, and 'cannot be miſtaken; 'tis clear, and viſible 'there, like the Light of bright Sunſhine; 'ſhews itſelf, and needs no other Proof but its 'own Evidence; they feel the Hand of GOD

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'moving them within, and the Impulſes of the 'Spirit, and cannot be miſtaken in what they 'feel. Thus they ſupport themſelves, and are 'ſure Reaſon has nothing to do with what they 'ſee and feel in themſelves; what they have 'a ſenſible Experience of, admits no Doubt, 'needs no Probation. Would he not be ridi-'culous who ſhould require to have it proved 'to him, that the Light ſhines and that he 'ſees it? It is its own Proof and can have no 'other. When the Spirit brings Light into our 'Minds it diſpels Darkneſs, we ſee it as we do 'that of the Sun at Noon, and need not the 'Twilight of Reaſon to ſhew it us. This Light 'from Heaven is ſtrong, pure, and clear; carries 'its own Demonſtration with it; and we may 'as rationally take a Glow-worm with us to aſ-'ſiſt us to diſcover the Sun, as to examine the 'celeſtial Ray by our dim Candle, *Reaſon*.

'This is the Way of theſe Men's talking: 'They are ſure becauſe they are ſure, their 'Pretenſions are right only becauſe they are 'ſtrong in them. For when what they ſay is 'only ſtripped of the Metaphor of Seeing and 'Feeling, this is all it amounts to, and yet theſe 'Similies ſo impoſe on them, that they ſerve 'them for Certainty to themſelves, and Demon-'ſtration to others.

'But then, ſays he, the Queſtion here is, 'How do I know that God is the Revealer of 'this to me; that this Impreſſion is made upon 'my Mind by his *Holy Spirit*, and that there-

'fore I ought to obey it? If I know not this, 'how great ſoever the Aſſurance is, that I am 'poſſeſſed with, it is groundleſs; whatever 'Light I pretend to it is but Enthuſiaſm. For 'whether the Propoſition, ſuppoſed to be re-'vealed, be in itſelf evidently true or viſibly pro-'bable, or by the natural Ways of Knowledge 'uncertain, the Propoſition that muſt be well 'grounded, and manifeſted to be true, is this, 'that God is the Revealer of it, and that what 'I take to be a Revelation is certainly put into 'my Mind by him, and is not an Illuſion drop-'ped in by ſome other Spirit, or raiſed by my 'own Fancy. For, if I miſtake not, theſe Men 'receive it for true, becauſe they preſume God 'revealed it. Does it not then ſtand them upon, 'to examine upon what Grounds they preſume 'it to be a Revelation from God? Or elſe all 'their Confidence is mere Preſumption; and this 'Light they are thus dazzled with is nothing 'but an *Ignis Fatuus*, that leads them conti-'nually round in this Circle. *It is a Revela-'tion becauſe they firmly believe it, and they be-'lieve it becauſe it is a Revelation.*

'And what readier Way, ſays he, can there 'be to run ourſelves into the moſt extravagant 'Errors and Miſcarriages, than thus to ſet up 'Fancy for our ſupreme and ſole Guide, and 'to believe any Propoſition to be true, any Ac-'tion to be right, only becauſe we believe it 'to be ſo. The Strength of our Perſuaſions are 'no Evidence at all of their Rectitude: Crook-

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'ed Things may be as ſtiff and inflexible as 'ſtraight; and Men may be as poſitive in Error 'as Truth. How come elſe the untractable 'Zealots in different and oppoſite Parties? For 'if the Light which every one (of theſe) thinks 'he has in his own Mind, which in this Caſe 'is nothing but the Strength of his own Per-'ſwaſion, be an Evidence that it is from God, 'contrary Opinions may have the ſame Title 'to Inſpiration; and God will be not only the 'Father of Lights, but of oppoſite and contra-'dictory Lights, leading Men contrary Ways; 'and contradictory Propoſitions will be divine 'Truths, if an ungrounded Strength of Aſſu-'rance be an Evidence that any Propoſition is 'a *Divine Revelation.*

'This cannot be otherwiſe whilſt Firmneſs of 'Perſuaſion is made a Cauſe of Believing; and 'Confidence of being in the Right is made an 'Argument of Truth. St. *Paul* himſelf belie-'ved he did well, and that he had a Call to it 'when he perſecuted the Chriſtians, whom he 'confidently thought in the Wrong. But yet it 'was he, and not they, who were miſtaken. 'Good Men are Men ſtill liable to Miſtakes, 'and are ſometimes warmly engaged in Er-'rors, which they take for Divine Truths, 'ſhining in their Minds with the cleareſt Light.

'Light, true Light in the Mind is, or can 'be, nothing elſe but the Evidence of the Truth 'of any Propoſition; and if it be a ſelf-evident 'Propoſition, all the Light it has, or can have,

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'is from the Clearneſs and Validity of thoſe 'Proofs upon which it is received. To talk of 'any other Light in the Underſtanding, is to 'put ourſelves in the Dark, or in the Power of 'the Prince of Darkneſs, and by our Conſent, 'to give up ourſelves to Deluſion to believe a 'Lie: For if the Strength of Perſuaſion be the 'Light which muſt guide us, I aſk, How ſhall 'any one diſtinguiſh between the Deluſion of 'Satan, and the Inſpirations of the Holy Ghoſt? 'Satan can transform himſelf into an Angel of 'Light. And they, who are led by the Son 'of the Morning, are as fully ſatisfied of the 'Illumination, *i. e.* are as ſtrongly perſuaded 'that they are enlightened by the Spirit of God 'as any one who is ſo: They acquieſce and 'rejoice in it, are acted by it; and no Body 'can be more ſure, nor more in the Right (if 'their own ſtrong Belief may be Judge) than 'they.

'He, therefore, who will not give himſelf up 'to all the Extravagancies of Deluſion and Er-'ror, muſt bring this Guide of his *Light within* 'to the Trial. God, when he makes the Pro-'phet, does not unmake the Man: He leaves 'all his Faculties in their natural State, to en-'able him to judge of his Inſpirations, whether 'they be of Divine Original or no. When he 'illuminates the Mind with ſupernatural Light, 'he does not extinguiſh that which is natural. 'If he would have us aſſent to the Truth of 'any Propoſition, he either evidenceth that

'Truth

'Truth by the uſual Methods of natural Rea-
'ſon, or elſe makes it known to be a Truth,
'which he would have us aſſent to, by his
'Authority, and convinces us that it is from
'him, by ſome Marks, which Reaſon cannot
'be miſtaken in. Reaſon muſt be our laſt
'Judge and Guide in every Thing. Every
'Conceit that thoroughly warms our Fancies
'muſt not paſs for Inſpiration, if there be no-
'thing but the Strength of our Perſwaſions,
'whereby to judge of our Perſwaſions, if Rea-
'ſon muſt not examine Truth by ſomething
'extrinſical to the Perſwaſions themſelves, In-
'ſpirations and Deluſions, Truth and Falſhood,
'will have the ſame Meaſure, and will not be
'poſſible to be diſtinguiſhed.

'If this internal Light, or any Propoſition,
'which under that Title we take for inſpired,
'be conformable to the Principles of Reaſon, or
'to the Word of God, which is atteſted Reve-
'lation, Reaſon warrants it, and we may ſafely
'receive it for true, and be guided by it in our
'Belief and Actions: If it receives no Teſti-
'mony nor Evidence from either of theſe Rules,
'we cannot take it for a Revelation, or ſo
'much as for true, till we have ſome other
'Mark that it is a Revelation, beſides our be-
'lieving that it is ſo. Thus we ſee the holy
'Men of old, who had Revelations from God,
'had ſomething elſe beſides that internal Light
'of Aſſurance in their own Minds, to teſtify
'to them that it was from God. They were

'not

'not left to their own Perſwaſions alone, that 'theſe Perſwaſions were from God, but had 'outward Signs to convince them of the Au-'thor of theſe Revelations. And when they 'were to convince others, they had a Power 'given them to juſtify the Truth of their Com-'miſſion from Heaven; and by viſible Signs 'to aſſert the Divine Authority of a Miſſion 'they were ſent with.' Of which he proceeds to give ſome Examples; and then concludes this Subject in the following Paragraph.

'In what I have ſaid, I am far from de-'nying that God can or does ſometimes en-'lighten Men's Minds in the apprehending of 'certain Truths, or excite them to good Ac-'tions, by the immediate Influence and Aſ-'ſiſtance of his Holy Spirit, without any ex-'traordinary Signs accompanying it. But in 'ſuch Caſes too we have Reaſon and Scripture, 'unerring Rules to know whether it be from 'God or no. Where the Truth embraced is 'conſonant to Revelation in the written Word 'of God, or the Action conformable to the 'Dictates of right Reaſon, or Holy Writ, we 'may be aſſured that we run no Riſk in enter-'taining it as ſuch; becauſe tho' perhaps it be 'not an immediate Revelation from God, ex-'traordinarily operating in our Minds, yet we 'are ſure it is warranted by that Revelation, 'which he has given us of Truth. But it is not 'the Strength of our private Perſwaſions within 'ourſelves, that can warrant it to be a Light or a

'Motion

'Motion from Heaven; nothing can do that but 'the written Word of God without us, or that 'Standard of Reaſon which is common to us 'with all Men. Where Reaſon or Scripture is 'expreſſed for any Opinion or Action, we may 'receive it as of Divine Authority; but it is 'not the Strength of our Perſwaſions, which 'can by itſelf give it that Stamp. The Bent 'of our Minds may favour it as much as we 'pleaſe, that may ſhew it to be a Fondling of 'our own, but will by no Means prove it to be 'an Offspring of Heaven, or of Divine Origi-'nal,' Thus far the judicious and diſcerning Mr. *Lock*.

I have been led into this Subject upon the Account of Mr. *Law's* myſtical Interpretation of the Creation, which he ſo confidently lays down as certain; but let his Notions have their firſt Riſe from any one Perſon, whoever he may be, I ſhall not object againſt the Meaneſs of the Perſon from whom they ſprung (which Mr. *Law* ſuppoſes a Reaſon of their ſo ſmall Entertainment, nor ſhall I form a more exalted Idea of them for being eſpouſed by ſo learned a Man as himſelf) ſince the Scriptures do not (tho' he pretends they do) favour any ſuch Conceptions, but, as I think, I have before ſufficiently proved, do plainly confute, ſuch myſtical Divinity; and therefore to be revived and maintained by a Perſon of reputed extraordinary Sanctity, his whimſical Sentiments may be the more greedily ſwallowed by many well-diſpoſed and pious

People·

People. And becauſe there are alſo many now-a-Days who eagerly follow the upſtart Pretenders to the Inſpiration of the Holy Spirit, as *Whitfield*, *Weſley*, and their Deputies, 'tis for that very Reaſon I have choſe to draw the preceeding Quotation to an uncommon Length; not for the Dignity of the Author's Perſon, or the Depth of his Learning (which is no more Inducement with me to ſwallow his Sentiments than it is with Mr. *Law*) but the Weight and Force of his Arguments and their Agreeableneſs to my preſent Subject, and the Dictates of Reaſon and Revelation: And to this I ſhall only add the following Inference, and then ſubjoin a Concluſion of the Whole.

Inference.

§. 3. Let us not then be carried away with any idle Chimeras for the Inſpiration of the Spirit, ſince the ſtanding Revelation of the Spirit of God only remains in his written Word, eſtabliſhed by the Divine Authority of ſuch Power and Miracles, as are beyond all human or diabolical Art. And had the ſame Inſpiration been neceſſary for their Interpretation, then would the like Miracles alſo have been as requiſite to have eſtabliſhed the Authority of ſuch Interpretations; or elſe, How ſhall we know, (when ſuch Interpretations are impoſed by ſo many Pretenders) who has that true and Divine Miſſion? For want of which almoſt every Pretender

to

to it (tho' widely different to one another) have their Followers, to whom their particular Spiritual Guide is Right, and all others Wrong and Impoſtors. From all which what ſhall we conclude? Even, that all, who pretend to more than what is promiſed (in regard to the Influence and Directions of God's Holy Spirit, common to all, as they ſincerely and impartially ask for it, and ſeek after it) are to be ſhun'd as falſe Prophets, which our Saviour forewarned us would, if it were poſſible deceive the very Elect (or Righteous Perſons) and therefore not to be run after nor hearkened to; the ill Effects of which is daily viſible amongſt us, by ſome turning melancholly, others mad, ſome ruining their Families, and others again deſtroying themſelves; which fatal Effects the Preaching of the Goſpel by Chriſt and his Apoſtles never had upon their Hearers?

I would not however be thought to charge Mr. *Law* with Doctrines that have carried along with them ſuch pernicious Conſequences, tho' his whimſical Divinity of the Creation, has led me into the Subject of Enthuſiaſm, which being almoſt always in Vogue, in one Shape or other, ought to be as conſtantly guarded againſt, ſince many well-meaning but unwary People are thereby very freqently enſnared, to their Ruin with the Cant and Deluſion of falſe Teachers. Amongſt whom I muſt count Mr. *Law*, whoſe Doctrine of the Creation is no better than a Whim, or Turn of his Brain by imagining

gining himſelf one of the Cabinet-Council and Secretaries of Heaven. But as a true Spirit of Chriſtian Charity ſeems to flow thro' his whole Works, and ſhews his extenſive Love to all Mankind; and as Charity will cover a Multitude of Sins; ſo it may atone for many Miſtakes; according to his own worthy Compariſon: 'If a Pilgrim, in travelling a different Road 'by himſelf ſhould happen to loſe a Leg, and the 'Uſe of an Eye, in his Journey, every chari-'table Chriſtian will be glad that he has ſtill one 'good Leg, and one good Eye left, that may di-'rect him to his Journey's End.'

The Concluſion of the Whole.

§. 4. And now, God having finiſhed all his Works, (of which I have endeavoured to take a tranſient View) he *ſaw every Thing that he had made, and behold it was very good: i. e.* The whole Creation of Heaven and Earth taken together, with all their Inhabitants and Furniture, of which all other Globes viſible to us muſt be a Part, and thoſe inviſible to us by the unaſſiſted Eye may alſo be underſtood, as I have in the firſt Part of this Work made it reaſonable to ſuppoſe: But as to the glorious Bodies of the Creation, which are to us inviſible, it cou'd be of no immediate Concern to us to have them made known to us any other Way than by the Help of Optick Glaſſes; and therefore Diſcoveries have been reſerved for the Exerciſe

of

of our reſpective Talents and Speculations, thereby to raiſe our Admirations, and excite our Adorations of the Infinite Power of our Almighty CREATOR. And tho' the Words of the Text do not include more than the viſible Bodies of the Creation, yet they do not exclude our Search after, and Belief of more. They apparently include Sun, Moon and Stars, and therefore all that we can diſcover with, or without the Help of Glaſſes.

As alſo in the Words of the Firſt Verſe of the Second Chapter. *Thus the Heavens and the Earth were finiſhed, and all the Hoſt of them.* —— It may be obſerved that, in the firſt Verſe of the firſt Chapter, *Moſes* gives us an Account, That, *In the Beginning God created the Heaven and the Earth.* Which Heaven and Earth there mentioned might only have an immediate Relation, (as the Hiſtory only reſpected this Globe's Inhabitants) to this Heaven and Earth belonging to us, as being only mentioned here in the Singular Number. But in the next Chapter, which I have before obſerved to be a Recapitulation of the Creation, or a further Explanation, *Moſes* concludes, 'Thus the Hea-'vens and the Earth were finiſhed, and all the 'Hoſts of them:' By the Heavens here, being in the Plural Number, and all the Hoſts of them, may be ſignified all the Heavenly Bodies, as Sun, Moon, and Stars, viſible or inviſible; with their proper Furniture, Productions and Inhabitants; and this, I think, gives a kind of Confirmation to my Comment upon the firſt

Verſe of the firſt Chapter; *viz.* That it was moſt reaſonable to ſuppoſe, That the whole material Creation, or that all the Material Globes of the whole Creation received their Creations and Formations together with this very Globe, which we inhabit; and as to the Philoſophical Reaſons for it, I refer you back to what I have advanced in the firſt Chapter.

The Reaſon why *Moſes* does not, in this Second Chapter, uſe the Plural Number to the Earth as well as Heaven, may be this, becauſe the other Planets, which we obſerve to be compoſed of the ſame Elements, and made ſimilar to this Earth, and therefore moſt probably for the like Uſes, are here by us in the common Acceptation of Mankind, taken Notice of as Stars, according to their common Appearances to us, and are therefore here recorded under the Denomination of the Hoſts of the Heavens and the Earth.

Thus were all the Works of infinite Wiſdom, and incomprehenſible Power completed: And as God beheld them very good, he ſet a-part the next Day for Reſt: For having ended his Work, which he had created and made, *he reſted on the Seventh Day*, which Day he thereupon bleſſed and ſanctified; and ſet it a-part, and enjoined it for a Day of Reſt from worldly Affairs and Concerns; that Man might every Seventh Day employ himſelf in the Survey and Contemplation of theſe his admirable and harmonious Works of Creation, wherein there was not one needful Thing wanting in that which God had created and made in the former Six Days:

Days: He therefore appropriates this Day to Divine Uſes and Contemplations. And what nobler and ſublimer Subjects could Mankind be employed about than the Meditations of theſe unfathomable, immenſe, immeaſurable, and inimitable Works of the Creation, which ſhew forth the unbounded Goodneſs, as well as unlimited Power, and unſearchable Wiſdom of their GREAT CREATOR? What can be more affecting to raiſe our Devotions, and excite our Thankſgivings, than to behold the vaſt Proviſions for Comforts and Subſiſtance; the Advantages of Light, and our viſionary Senſes, adapted for the Reception and Enjoyment of it, thereby to behold all the Beauties of the viſible Creation; and the reſt of our Senſes as duly, and proportionably provided for, both to the Pleaſure and Satisfaction thereof? Here are the Harmonies of the Heavens and Earth to ſatisfy our Deſires, to raiſe our Admirations, and to delight our Senſes; to command our Gratitude; to put us upon the Wings of Spiritual Flights; to raiſe us from Earth to Heaven: And from the Receſſes of the Heart to cauſe our Tongues to expreſs the moſt raviſhing Raptures of Extaſies and Joys.

Theſe were the Exerciſes appointed for this Day upon its firſt Commencement; which, notwithſtanding the Fall of Man from his original Purity, was yet appointed to the ſame Purpoſes, upon the Promiſe of Man's Redemption; and was continued to have its full Injunction till the Reſurrection of our bleſſed Re-

deemer on the first Day of the Week; and as it had till then been observed as a Day of Rest from worldly Labour, for Contemplations upon the Works of Creation; so, as the Affairs of the first Christian Churches would admit of its Change from the seventh to the first Day of the Week, it was accordingly transferred, for this Reason; because a still more beneficial Work was completed for Mankind, in their Redemption by the Resurrection of our blessed Lord, JESUS CHRIST, on the first Day of the Week: when by that Means he had gained the Victory over Death and completed our Redemption, and Deliverance from the Bondage of Sin, upon the Conditions of our new Obedience to the Gospel Covenant, which, that we may ever remember, we have this Day set apart to renew, and raise our Spirits from the low and groveling Objects of this present fallen Estate, to put us upon the Wings of heavenly Aspirations and Longings after a full Fruition of Spiritual Delights, that are thro' Christ to be attained, when we shall put off these Bodies of Mortality: Which happy Estate may all Men arrive at by true Obedience, Faith and universal Charity thro' the Merits of our blessed Redeemer; to whom with the Father, and holy Spirit be ascribed the Kingdom, Power and Glory for ever and ever. *Amen.*

FINIS.

THE CONTENTS.

THE INTRODUCTION. *Page* 1.

CHAP. I.

Sect. 1. *THAT God in the Beginning created the Heaven and the Earth from their Non-existence, proved from the Words of* Moſes. 3

2. *This Account of* Moſes *proved true Philoſophically,* 5

3. *That it is moſt reaſonable to ſuppoſe, That the Creation and Formation of our Earth may bear Date with the moſt ancient Workmanſhip of God in material Productions; and that it is moſt probable, That all the material Globes of the Univerſe received their Productions and Formations together,* 6

COROLLARY.

The Advantages of thoſe who exiſt in the latter Ages, could be no ways compenſated to ſuch as were living in the former, but by their Longevity, 13

CHAP. II.

Sect. 1. *Why Darkneſs was upon the Face of the D in its Chaotical State,* 16
2. *How by the Movement of the Spirit of God upon the Face of the Waters, the groſſer and finer Parts of the Chaos began to ſeparate and admit of Light,* 18
3. *That God's Command, Let there be Light, eſtabliſhed the Laws of Gravitation and Attraction,* 18
4. *That the firſt Benefit of this eſtabliſhed Law was the Admiſſion of Light,* 20
5. *The uſefulneſs of Light and the Neceſſity of its Exiſtence in the material Creation,* 22
6. *The Benefits of the Diviſion of Light and Darkneſs, and how equally divided throughout the Globe,* 23
7. *That Man's Fall chang'd Nature's firſt Purity, and brought Diſorders and Death, which was abſolutely neceſſary ſhould enſue Tranſgreſſions; ſince otherwiſe he could have had no Redemption; with a Theological Corollary,* 26

CHAP. III.

Sect. 1. *Light called Day, and Darkneſs Night; how ſucceſſive round the Globe, and, as neceſſary in every Part, therefore every Part receives it by Turns,* 32
2. *That from the Meridian, where Light firſt approached, to that Part where it appeared in the Horizon, the Morning of the firſt Day commenced,* 32
3. *That a Day natural may be taken from any Part of one Day to the ſame Time the next; and that the Evening and Morning, being ſaid to be the firſt Day, includes one Day natural,* 33
4. *Why Evening is here mentioned before Morning, and that it does not from thence follow, That this Work of Formation was begun in the Evening, but ſhews that it begun in the Morning,* 34

5. That

5. *That the Morning of the first Day must commence round the Globe, as Light was successively propagated to every other Meridian; with a Theological Corollary how to employ our Day of Life,* 35

CHAP. IV.

Sect. 1. *That the Laws of Gravitation and Attraction separated the Waters upon the Superficies from the Waters in the Firmament or open Air,* 38
2. *That the Waters in the Firmament probably bear a Proportion, as well as a Communication, with those in the Seas,* 39
3. *That the Notions of the Ancients, That the Waters above the Firmament were above the fixed Stars, is needless to repeat or confute,* 40
4. *That the raising the Firmament or Atmosphere from the settling Globe's Superficies, prepares it to become fit for Inhabitants,* 40
5. *That the Waters above and those below the Firmament have a continual Communication; with the Benefits thereof,* 41
6. *The Admission of Light and Sounds, with their Progressions,* 42
7. *How Clouds are supported,* &c. 44
8. *Springs on high Mountains, how maintained,* 45
9. *The mutual Concourse of the Waters after their Separation,* 46
10 *Why the Atmosphere was called Heaven,* &c. 47

CHAP. V.

Sect. 1. *By the first established Laws in Nature the Work of the Earth's Formation is carried on, and continued,* 49
2. *That the Earth had an uneven Surface, upon its first Formation, for the Collection of the Waters* 51
3. *The Names of Earth and Seas, with a Theological Corollary,* 53

CHAP. II.

Sect. 1. *Why Darkneſs was upon the Face of the D in its Chaotical State,* 16
2. *How by the Movement of the Spirit of God upon the Face of the Waters, the groſſer and finer Parts of the Chaos began to ſeparate and admit of Light,* 18
3. *That God's Command, Let there be Light, eſtabliſhed the Laws of Gravitation and Attraction,* 18
4. *That the firſt Benefit of this eſtabliſhed Law was the Admiſſion of Light,* 20
5. *The uſefulneſs of Light and the Neceſſity of its Exiſtence in the material Creation,* 22
6. *The Benefits of the Diviſion of Light and Darkneſs, and how equally divided throughout the Globe,* 23
7. *That Man's Fall chang'd Nature's firſt Purity, and brought Diſorders and Death, which was abſolutely neceſſary ſhould enſue Tranſgreſſions; ſince otherwiſe he could have had no Redemption; with a Theological Corollary,* 26

CHAP. III.

Sect. 1. *Light called Day, and Darkneſs Night; how ſucceſſive round the Globe, and, as neceſſary in every Part, therefore every Part receives it by Turns,* 32
2. *That from the Meridian, where Light firſt approached, to that Part where it appeared in the Horizon, the Morning of the firſt Day commenced,* 32
3. *That a Day natural may be taken from any Part of one Day to the ſame Time the next; and that the Evening and Morning, being ſaid to be the firſt Day, includes one Day natural,* 33
4. *Why Evening is here mentioned before Morning, and that it does not from thence follow, That this Work of Formation was begun in the Evening, but ſhews that it begun in the Morning,* 34

5. That

5. *That the Morning of the first Day must commence round the Globe, as Light was successively propagated to every other Meridian; with a Theological Corollary how to employ our Day of Life,* 35

CHAP. IV.

Sect. 1. *That the Laws of Gravitation and Attraction separated the Waters upon the Superficies from the Waters in the Firmament or open Air,* 38
2. *That the Waters in the Firmament probably bear a Proportion, as well as a Communication, with those in the Seas,* 39
3. *That the Notions of the Ancients, That the Waters above the Firmament were above the fixed Stars, is needless to repeat or confute,* 40
4. *That the raising the Firmament or Atmosphere from the settling Globe's Superficies, prepares it to become fit for Inhabitants,* 40
5. *That the Waters above and those below the Firmament have a continual Communication; with the Benefits thereof,* 41
6. *The Admission of Light and Sounds, with their Progressions,* 42
7. *How Clouds are supported,* &c. 44
8. *Springs on high Mountains, how maintained,* 45
9. *The mutual Concourse of the Waters after their Separation,* 46
10 *Why the Atmosphere was called Heaven,* &c. 47

CHAP. V.

Sect. 1. *By the first established Laws in Nature the Work of the Earth's Formation is carried on, and continued,* 49
2. *That the Earth had an uneven Surface, upon its first Formation, for the Collection of the Waters* 51
3. *The Names of Earth and Seas, with a Theological Corollary,* 53

CHAP. VI.

Sect. 1. *The Production of Grass, Herbs, and Fruit Trees: Their Essences were created in the Production of the Chaos, &c.* 55

2. *That their future Productions depended upon their several Seeds in themselves; as does the Encrease and Multiplication of Animals,* 56

3. *Why God created Vegetables, Animals, and Men to encrease by Seminal Productions,* 59

4. *That the whole Productions of future Plants, Animals, &c. were not contained in the first in Miniature, but only their next Productions, which is constantly preserved in the Seeds, which constitute their several Species,* 62

5. *That the Souls of all Men were not created together, nor were all* Adam's *Seminal Productions in his Seed in Miniature, but a like seminal Property was communicable from him to his Progeny; with a Corollary,* 65

6. *The admirable Varieties, and Uses of Herbs, Vegetables, Trees and Fruits; their Provisions for Preservation and sufficient Fruitfulness to answer all Purposes,* 69

7. *The Security for the Continuation of such Vegetables that come not under the Care of the Husbandman,* 71

8. *The Proportion between the Roots and Branches of Trees,* 72

9. *The most useful Grains the most encreasing, and easiest to be propagated, &c.* 72

10. *From the Usefulness God saw they would be to the future Animal Creation, God pronounced them Good; with a Corollary,* 74

CHAP. VII.

A Survey of the Heavens.

Sect. 1. *That Sun, Moon, and Stars are said to be created*

created upon their Atmoſpheres becoming clear to entertain each other's Rays, whereby they became capable of ocular View, 76
2. That theſe Lights were appointed for Signs and Seaſons, &c. but not to predict future Events aſtrologically, 78
3. That the Moon and Planets ſhine by the reflected Light of the Sun, and the fixed Stars by a native Light; and that the Sun is both the Center and Soul of this Syſtem, 80

CHAP. VIII. Of the SUN.

Sect. 1. That the Sun's Diſtance and Magnitude are wiſely adjuſted; and that the Atmoſpheres of the Earth, and the reſt of the Planets, are as duly adapted to their ſeveral Diſtances, 84
2. His Magnitude and Diſtance, how computed, and what, 90
3. There is ſufficient Room in infinite Space; for all Diſtances, whatſoever, are neceſſary for Globes to perform their regular Motions in, 92
4. That the fixed Stars are 27000 Times more remote than the Sun, 93
5. That Space is infinite, and incomprehenſible, 94
6. That the Sun's Motion is only upon its own Axis, with the Uſes thereof, 96

CHAP. IX. Of the MOON.

Sect. 1. Of her Light and various Appearances, 98
2. Of her Nodes, and Cauſe of Eclipſes: The Eclipſes of the Sun not alike to all Latitudes in the Hemiſphere where they are viſible; but, 99
3. Eclipſes of the Moon are alike to the whole Hemiſphere where they are viſible; with the Reaſons, 103
4. Eclipſes of the Earth to the Inhabitants in the Moon appear

appear alike to the whole Hemiſphere towards us; but Eclipſes of the Sun various, 103
5. *That the Earth appears to the Inhabitants of the Moon vaſtly larger than the Sun and reflects her Light into the darkned Hemiſphere of the Moon, as may be ſeen before and after the Moon's Changes* 105
6. *The Moon's Progreſſions and Vagations.* 106
7. *Of the Government of Tides by the Moon, and how they are repeated twice in about 24 Hours and 49 Minutes,* 113
8. *An Obſervatory Recapitulation of the mutual Services of the Earth and Moon to each other: That the Longitude at Sea is moſt likely to be diſcovered by the Moon's Vagations; with the moſt proper Time to make the firſt Experiments thereof; with a Corollary,* 116

CHAP. X. Of MERCURY.

Sect. 1. *His Orbit, and when he can become viſible to a naked Eye,* 121
2. *Obſervations on his reſpecting the Sun as his Center,* 123
3. *That he is an Opake Body, as the Earth and Moon,* ibid.
4. *His computed Diameter,* ibid.
5. *The Benefits ariſing to us from our Obſervations of* Mercury, 124
6. Mercury's *Services to the Earth, doubly returned by it; with a Corollary,* 124

CHAP. XI. Of VENUS.

Sect. 1. *Her Orbit and diurnal Rotation,* 126
2. Mercury's *diurnal Rotation uncertain,* ibid.
3. Venus's *Diſtance from the Sun; her periodical Revolutions and Conjunctions with the Sun, in turning from*

from Morning to Evening, and from the Evening to the Morning Star, 127
4. *She has no Moon; but the Earth and Moon make good that Deficiency, as will appear from considering how they appear at* Venus; Mercury *also is of the same Service to her, as she is to the Earth,* 129
5. *She shines by the reflected Light of the Sun,* 130
6. *The dark Spots discovered upon her, and the rest of the Planets, are the Seas or Collections of Waters upon them, from whence their diurnal Rotations are discovered; with a concluding Meditation,* 131

CHAP. XII. Of MARS.

Sect. 1. *His Periodical Revolution, Rotation and Orbit; and that he has no Moon,* 133
2. *His Appearances to us upon his Oppositions and Quadratures to the Sun,* 134
3. *The Usefulness of* Saturn *and* Jupiter *to him in his Passages by them; and how often his Conjunctions with them happen,* 136
4. *Reflection, why he has no Moon,* 137

CHAP. XIII. Of JUPITER.

Sect. 1. *His Orbit circumscribes the Orbits of* Mars, *our Earth and Moon,* Venus *and* Mercury, *and therefore scarce any of them useful to him or observable to his Inhabitants, (the Earth being computed 400 Times less than Jupiter) but his four Moons make good that Deficiency,* 139
2. *Tho' his Distance from the Sun is four Times further than the Earth, yet it is probable that he receives as much of his Light and Heat as the Earth does,* 140
3. *That he is no tutelar Sun, but shines by a borrowed Light,* 141

4. *That* Jupiter's *Inhabitants may most likely imagine that their own Globe, and Moons with what they may sometimes observe of* Saturn *and his Moons, are all the Planets belonging to the Solar System,* 143
5. *The Transits of the Earth, and Planets circumscribed by* Jupiter's *Orbit between him and the Sun will scarcely be able to make an observable small Speck in his luminous Face,* 144
6. *The Difficulties which* Jupiter's *Inhabitants lie under as to their distinguishing between Realities and common Appearances,* 145
7. *What our Notions might be (if born there) concerning the Sun and Moons,* 146
8. *The Times of the Revolutions of his Satelites or Moons, and how their Motions appear there,* 147
9. *By Remarks on these Motions, some curious Observators* there *may probably judge of their true and apparent Motions; from whence may arise Controversies and curious speculative Hypotheses,* 149
10. *The complicated Forces of* Jupiter's *Moons serve to purge his Seas by Tides,* 150
11. *Their Illuminations to* Jupiter *are return'd in a multiply'd manner,* 150
12. *That our Moon, and most probably* Jupiter's *and* Saturn's *have only a diurnal Rotation commensurate with their periodical Revolutions, and that this Phænomena in the Secondary Planets is most providentially adjusted to their Benefits,* 151
13. *Of the Eclipses of* Jupiter *and his Moons, as they happen and appear to one another, with their Usefulness to us, and amongst themselves,* 155
14. *What his* Belts *are,* 157

CHAP.

CHAP. XIV. Of Saturn.

Sect. 1. *His Orbit and Distance from the Sun* 159
2. *His Moons and Ring's Phœnomena,* 160
3. *His outermost Moon's uncommon Distance, and that it may probably have a secondary Attendant itself,* 164
4. *The Magnitudes of his Satellites,* 166
5. *That the Inhabitants of* Saturn *and his Moons have not Means to discover any other Globes of the Solar System, than their own, except sometimes, tho' very rarely,* Jupiter, *ibid.*
6. *How the fixed Stars appear at* Saturn, 169
With a Theological Conclusion of the Survey of the Heavens, 170

CHAP. XV.

A Survey of the Animal Creation.

Sect. 1. *The Globes and their necessary Furniture being prepared for Habitation, how God then proceeded to the Animal Creation, and began with the Productions of Fishes and Fowls,* 173
2. *Of Fishes in particular, their Shapes, Structure and Cloathing, adapted to their Element and Motions,* 176
3. *The Sizes of Whales, and Animalcules,* 177
4. *The Eyes of these watery Inhabitants suited to their Element,* 178
5. *No Voice discoverable amongst them to communicate their Ideas to each other, but they have a kind of Breathing,* 178
6. *Their Provision,* 179

CHAP.

CHAP. XVI. Of Fowls.

Sect. 1. *Upon their Creation began the Audible Songs of Praiſe to their benevolent Creator; they alſo wait their Governor Man's coming to congratulate him at his Coronation, and to excite his Thankfulneſs.* 180
2. *Their Make and Shape conſider'd: Their Flights wonderful and not experimentally accountable,* 184
3. *Of their Intelligence,* 192
4. *That many of them are capable to learn Words and Sentences in Human Language; and how far they underſtand them,* 196
5. *Their admirable Art in building their Neſts,* 197
6. *That ſeveral of theſe Species change Climates in Summer and Winter, and others their Manner of Exiſtence, but that none quit this Globe, as ſome imagine, to go to the Moon, during their Abſence,* 199
7. *A concluding Obſervation on the Fowls,* 203

CHAP. XVII.

Of the Production of Cattle, &c.

Sect. 1. *Cattle and creeping Things how adapted to the common Offices and Occaſions of Life,* 205
2. *The Senſations of Seeing, Hearing, Smelling, Taſting, and Feeling, are common to all Land Animals,* 207
3. *That the Situation for the Entertainment of theſe Senſes is moſt commodiouſly placed,* 210
4. *Of the Spider's multiplicity of Eyes,* 213
5. *Of the Cameleon's uncommon Eyes, which anſwer for her Head's being fixed to her Shoulders, without a Neck to turn it,* 213
6. *The Senſe of Pleaſure and Pain in Quadrupeds,* 215
7. *Of their Intellectual Faculties, particularly of Dogs, Horſes, &c.* 215
8. *The wonderful Senſe of ſmelling in Dogs,* 218
9. *The Oeconomy and Government of Beavers,* 220
10. *Of Coneys,* 222
11. *Of the Poſture of Quadrupeds,* 222
12. *Of their Stomachs,* 223

CHAP. XVIII. Of Inſects.

Sect. 1. *What Species come under the Denomination of Inſects,* 224

2. *Tho'*

2. *Tho' they are the most minute, yet they are not the least inconsiderable Part of the Creation,* 224
3. *Their Intelligence,* 227
4. *The Oeconomy of Bees,* 227
5. *The Wisdom of the Ant,* 232
6. *The Voraciousness of Spiders,* 234
7. *Of their different Kinds, Propagations and Securities against Winter,* 236
8. *That the smallest Animalcules are the most fruitful of all Animals,* 237
9. *That all propagate by Male and Female, and an Example of Insects Security against Winter; with a Conclusion,* 238

CHAP. XIX. Of Reptils.

Sect. 1. *Things common to other Animals not regarded in these,* 242
2. *Of their peculiar Make, Shape and Motion,* 242
3. *The remarkable Poison in many of this Kind, with an Inference,* 244

CHAP. XX. Of the Creation of Man.

Sect. 1. *The singular Method of Man's Creation in the Image of his Maker, that he might be his Representative and sole Governor of the whole Fabrick,* 248
2. *Notwithstanding all the Retinue of Animals, made before* Adam, *and brought unto him, he found himself alone for Want of a Help Meet, therefore God makes him a Female Companion, and institutes their Matrimonial Contract, in which was at first established their Equality in Government,* 251
3. *Hence we may observe, that the first Institution of Marriage was designed to be a perpetual Obligation of Truth, Fidelity and Constancy between one Male and one Female, without Poligamy or promiscuous Acts of Propagation, of which first Simplicity our blessed Saviour commands a Restoration,* 252
4. *The Happiness of such a State, where it is enjoy'd by Man and Wife, and the Disorders and Confusions that attend the Contrary,* 254
5. *An Observation upon it,* 258
6. *Their Command to be fruitful and multiply,* 260

CHAP.

CHAP. XXI.

Sect. 1. *By the Meat assigned to Man and Beast it appears Man was to live by Food; consequently it is observed,* 264

Obs. 1. *That* Adam's *Body was created a natural and material Body, and not, as Mr.* Law *supposes such an one as our Bodies will be in our State after the Resurrection,* 266

Obs. 2. *If* Adam's *Body was spiritual before Transgression, then was there no Materiality in the whole Creation, and they that now maintain an Ideal World are only guilty of the same Absurdity,* 270

Obs. 3. *That this Globe is not the Ruins of an Angelical World, sunk into Materiality by the Disobedience of the fallen Angels,* 271

Obs. 4. *God created this World from its Non-existence: For had it been sprung from the Ruins of an immaterial Angelical World by the Disobedience of the fallen Angels, it would have been the Work of the Devil; and not the Work of God and what he pronounced it. Hence is shewn in four Corollaries,* 272

Cor. 1. *The Weakness of this Mystical Divinity defended by Mr.* Law, 273

Cor. 2. *That the pretended immediate Inspiration of the Spirit of God upon* Jacob Behman *will not warrant Mr.* Law *to follow or support his Mystical (I mean Whimsical) Notions,* 274

Cor. 3. *The Scriptures are the standing Revelation of God to Man, and there is no new Revelation to be expected; nor the same Inspirations necessary for Interpreters as there was for the first Propagators of it, Yet,* ibid.

Cor. 4. *All Christian Ages have had such Upstarts and Pretenders to Inspiration,* 276

2. *How to discern between the Spirit of Truth, and that of Error and Enthusiasm,* 276

3. *An Inference,* 286

4. *The Conclusion of the Whole,* 288